

The Pan-Pacific Entomologist

Vol. I, No. 4.

April, 1925

BEES OF THE GENUS *CÆLIOXYS* IN THE COLLECTION OF THE CALIFORNIA ACADEMY OF SCIENCES

BY T. D. A. COCKERELL
Boulder, Colorado

1. *CÆLIOXYS COQUILLETII* Crawford

Females. California: Coronado, August 3 (Blaisdell); San Diego, August 23 (Blaisdell) South Sonoma County, October 6 (Kusche); Santa Cruz, November 4 (Van Duzee).

Males. California: Sacramento, May 27 (Van Duzee). This seems to be the male of *C. coquilletti*, although the femora are black and the tibiae suffused with black; the spurs are very light ferruginous. The fourth abdominal sternite is produced and shining at end, but dark, rounded, and not emarginate. There are two small spots of white hair in the scutello-mesothoracic sutures, as in the female.

2. *CÆLIOXYS NOVOMEXICANA* (Cockerell)

Females. Arizona: Cochise County, June 26 (V. W. Owen). California: Mokelumne Hill, September (Blaisdell); Oak Glen Lodge, San Bernardino County, 5000 feet, July (F. C. Clark); Stockton, August 20 (Van Duzee); Sobre Vista, Sonoma County (Kusche).

Males. Arizona: Cochise County, June 26 (V. W. Owen).

3. *CÆLIOXYS MENTHÆ* Cockerell

Females. Arizona: Cochise County, June 26 (V. W. Owen).

4. *CÆLIOXYS TEXANA* Cresson

Female. Arizona: Cochise County, June 26 (V. W. Owen).*

*This is the genuine *C. texana*. For many years I have had in my collection a species collected by Dr. S. Graenicher in Washington County, Wisconsin, July 23, 1907, and determined by him as *C. texana*. I had uncritically accepted this determination, but the insect is really quite different, and may be separated thus:

Coelioxys wisconsinensis Cockerell, n. sp. Female (type) about 12 mm. long, black, less robust than *C. texana*, the abdomen conspicuously more slender, and the long last ventral segment, which is fringed with long (short in *texana*) hairs at sides, much more pointed, acute, more as in *C. hunteri* Crawford. Other differences are as follows: scape more slender, antennae entirely black; clypeus less densely punctured, less hairy; supraclypeal region with a prominent median polished ridge; meso-

5. *CÆLIOXYS RUFITARSIS* Smith

Females. Utah: Salt Lake City, July 1 (Van Duzee). California: Shasta County, July 23 (Kusche).

Males. Utah: Salt Lake City, July 1 (Van Duzee); Logan, July 18 (Van Duzee); Park City, July 3 (Van Duzee); Lagoon, June 30 (Van Duzee). Oregon: Wallowa Mountains, Baker County, July 5 (Van Dyke). Washington: Wawawai (W. M. Mann). The Lagoon specimen is very remarkable in having apparently hairless eyes; with a microscope it is possible to see a very few hairs, including one long one on the left eye. Possibly the eyes are denuded, but I think we have a bare-eyed mutation.

6. *CÆLIOXYS RUFITARSIS RHOIS* Cockerell

Females. Utah: Logan, July 15 (Van Duzee). Oregon: Colestin, Jackson County, July 30 (Van Duzee). On account of the black tegulæ these fall with *rhois*, but in all the terminal lobe of the apical ventral segment is distinctly narrower than in the type of *rhois* from the White Mountains of New Mexico. Also, the hair on the eyes is white, whereas in type *rhois* it is pale yellowish. Thus, although the Utah and Oregon specimens cited belong to *rhois*, as defined by Crawford, it might be better to use that name in a much more restricted sense. The Logan male (see above) has dark reddish tegulæ.

7. *Cælixys rufitarsis claripes* Cockerell, subsp. n.

Male. Femora strongly stained with red above; tibiæ and tarsi entirely red, antennæ entirely black; eyes with long hair.

Type, male, No. 1633, Mus. Calif. Acad. Sci., collected by E. P. Van Duzee, June 6-12, 1917, at **Keen Camp, Riverside County, California.**

8. *Cælixys mediata* Cockerell, n. sp.

Female. I had this mixed with *C. rufitarsis rhois*, but it is easily separated by the hair on the eyes, which (as in *C. coquilletti*) is only about half as long, and is pure white. It is smaller

thorax less densely punctured; hair-marks of thorax above entirely white; axillar spines smaller; scutellum shorter and more rounded; femora with some blackish suffusion behind; basin of first abdominal segment with a sharp margin, behind which is a white hair-band, falling in middle. The tarsi are black, the hind pair with orange pubescence on inner side.

The male is given in my table in *Canad. Entomologist*, June, 1912, as *C. texana*. The color of legs and other features separate this from *C. alternata* Say.

than *rhois*, with green eyes, shorter and more curved axillar spines, and much narrower apical lobe of last ventral segment. It differs from *C. coquilletti* by the black (or very faintly reddish) tegulae, and femora black except at apex. The abdomen is entirely black, above and beneath; the fifth segment is entirely minutely granular, except basally where there are some fairly distinct punctures. The first dorsal is not densely punctured above as it is in *coquilletti*. The insect is thus between *coquilletti* and *rufitarsis*; possibly to be regarded as a race of the former. From *C. angulifera* Ckll., it is at once known by the angular projections at sides of last dorsal segment.

Male. California: Millbrae, September 1, 1912 (F. E. Blaisdell). Looks like the male of *C. rufitarsis*, but easily separated by the short hair on eyes. The tibiae are black except at apex, the tarsi bright ferruginous. The margin of fourth abdominal sternite is evenly rounded.

Type, female, No. 1634, Mus. Calif. Acad. Sci., collected by Dr. E. C. Van Dyke, September 1, 1912, at **Millbrae, California**.

9. CÆLIOXYS GILENSIS Cockerell

Female. California: Cayton, Shasta County, July 9 (Van Duzee).

10. CÆLIOXYS DEANI Cockerell

Females. California: Bear Valley, San Bernardino County, August 17 (F. C. Clark); South Fork Kings River, July 8 (Van Dyke). This species is smaller than *C. gilensis*, and has the first recurrent nervure joining the second cubital cell very near the base, or even meeting the intercubitus. Probably *C. deani* has a different host, but its status as a distinct species is rather doubtful.

Males. California: Bear Valley, San Bernardino Mountains, July and August (F. C. Clark); Kings River Cañon, Fresno County, July 2 (Van Dyke); Oak Glen Lodge, San Bernardino County, 5000 feet, July (F. C. Clark). In all these, the apex of abdomen is a little broader than in the type male of *C. deani*.

11. CÆLIOXYS APACHEORUM Cockerell

Female. Utah: King's Station, Davis County, July 24 (Van Duzee).

12. *CÆLIOXYS MOESTA* Cresson

Females. Utah: Daniels Cañon, Heber, July 5 (Van Duzee). California: Fallen Leaf Lake, July (L. S. Rosenbaum). A very widely distributed and variable species; known from the allied *C. porterae* Ckll. by the very short axillar spines. From *C. angulifera* Ckll. it is known by the much shorter axillar spines, grooves not continuous across second and third abdominal segments, much longer hair on eyes, etc.

13. *CÆLIOXYS RIBIS* Cockerell

Females. California: Strawberry Valley, El Dorado County, August 14 (Van Dyke); Kings River Cañon, Fresno County, July 8 (Van Dyke).

Male. (No locality label) collected by Dr. Van Dyke.

14. *CÆLIOXYS RIBIS KINCAIDI* Cockerell

Male. British Columbia: Nanaimo Biological Station, June 28 (Van Duzee).

15. *CÆLIOXYS ANGULIFERA* Cockerell

Male. California: Paradise Valley, Fresno County, July 15 (Van Dyke).

16. *CÆLIOXYS MEGATRICHA* Cockerell

Males. California: Coronado, September 15 (Blaisdell); hills back of Oakland, August 2 (Van Dyke). The lower apical teeth of the abdomen are less divergent than in the type, but the species is certainly the same.

17. *CÆLIOXYS FRAGARIAE* Cockerell

Male. California: Cascada, Fresno County, 6000 feet, July 29 (Van Duzee).

18. *CÆLIOXYS DEPLANTA* Cresson

Males. California: Millbrae, September 1 (Van Dyke); Poway, San Diego County, May 20 (Blaisdell). Utah: Salt Lake City, June 27 (Van Duzee).

19. *CÆLIOXYS QUERCINA* Cockerell

Males. California: Huntington Lake, 7000 feet, July 27 (Van Duzee).

20. *Cælixys salinaria* Cockerell, n. sp.

Male. Length about 8.5 mm.; black, with white hair, dense and pure white on face; knees, tibiae and tarsi bright ferruginous, femora

somewhat suffused with red; eyes light green, with short hair; antennæ entirely black; lower part of cheeks with a bevelled space; head and thorax above coarsely punctured, the punctures well separated on vertex, dense on mesothorax, but some shining surface showing in middle; hair-marks of thorax above weak, except white bands in front of and behind scutellum; scutellum not produced or tuberculate; axillar spines well developed, curved; tegulæ bright ferruginous; wings dusky at apex; stigma bright ferruginous, nervures fuscous; first recurrent nervure joining second cubital cell some distance from its base, and second a like distance from apex; anterior coxæ spined; spurs ferruginous; abdomen with white hair-bands, no basal one on first segment; transverse sulci of second and third tergites deep and entire; no foveæ on second segment; lateral and lower apical spines of abdomen slender and sharp; upper apical simple, much more divergent than lower; fourth ventral not bidentate. Apparently allied to *C. edita* Cresson, but distinguished by the color of the legs.

Type, male, No. 1635, Mus. Calif. Acad. Sci., collected by E. P. Van Duzee, July 1, 1922, at **Salt Lake City, Utah**. Paratype, one male, same data.

21. *Cœlixys asclepiadis* Cockerell, n. sp.

Male. Length slightly over 9 mm.; black, including the antennæ, but tarsi dark red, and the femora and tibiæ reddish-black; pubescence very dense and pure white on face, mainly white on thorax and abdomen, but light yellowish along mesothorax anteriorly (thickened sublaterally, but not forming dentiform projections), and a spot of the same color behind tegulæ, and band in scutello-mesothoracic suture; eyes light brown, with short hair; head and thorax above coarsely and densely punctured; scutellum neither produced nor tuberculate; axillar spines stout, not very long; cheeks with a bevelled space below; mesopleura shining, punctured, bordered in front and behind with white hair; tegulæ black; wings dusky apically and a streak in marginal cell; stigma ferruginous, nervures fuscous; first recurrent nervure joining second cubital cell some distance from base; anterior coxæ with short spines; spurs red; abdomen with white hair-bands, first segment with an entire and very distinct basal one, which is slightly yellowish; transverse sulci on second and third tergites failing in middle; no foveæ on second segment; apex rather produced, with a very deep median sulcus; lateral and lower apical spines sharp; upper apical entire, very thick and blunt, not or hardly more divergent than lower; translucent apex of fourth tergite broadly emarginate, and before it a bright ferruginous patch. A pollen body of *Asclepias* is attached to the left hind leg of the type.

Resembles *C. angelica* Ckll., but easily separated by the broader axillar spines, fulvous tint of hair-markings on thorax above, first recurrent nervure remote from intercubitus, etc.

Type, male, No. 1636, Mus. Calif. Acad. Sci., collected by Virgil Owen, June 26, 1916, in **Cochise Co., Arizona**. Presented to the Academy of Sciences by Mr. J. E. Law.

22. *Cælioxys hypodonta* Cockerell, n. sp.

Male. Length about 11 mm.; black, including legs and antennæ, the tarsi refuscent at apex; fourth and fifth abdominal tergites rufous basally; tegulæ dark rufous; pubescence white, dense on face; eyes pale green, with long hair; cheeks with a bevelled space below; head and thorax above densely and coarsely punctured; scutellum neither produced nor tuberculate; axillar spines stout, moderately curved, not very long; mesopleura covered with long hair; wings slightly reddish, stigma and nervures ferruginous; first recurrent nervure remote from intercubitus; spurs dark; hair on inner side of hind tarsi light yellow; hind edge of first abdominal segment very narrowly red; sulci across second and third segments deep and entire; foveæ on second segment transversely oval, quite large, without an impunctate margin; no distinct spines at sides of fifth segment; spines at sides of sixth well developed, but blunt; lower apical spines long, slender, parallel, rather wide apart, not sharply pointed; upper apical spines about half as long, stout, rounded, more divergent than lower; fourth ventral segment with an acutely bidentate process; fifth with an expanded hyaline margin.

Very distinct by the abdominal characters.

Type, male, No. 1637, Mus. Calif. Acad. Sci., collected by Mr. L. S. Rosenbaum, in July, 1915, at **Fallen Leaf Lake, California**.

In Annals Entom. Soc. America, June, 1914, Crawford gives a very good table for the separation of female *Cælioxys*, and I gave a table of females in Psyche, October, 1905. The males recorded above are not so easily separated, so I offer a new table, as follows:

Legs red	1
Legs black, with tarsi, and sometimes also tibiæ, red.....	5
Legs black	10
1. With linear transverse foveæ on second abdominal tergite behind groove	2
Without linear transverse foveæ on second abdominal tergite; hair of eyes short; tegulæ bright ferruginous.....	3
2. Anterior femora mainly clear red; axillar spines long; tegulæ bright ferruginous.....	<i>megatricha</i> Ckll.
Anterior femora black, red above; axillar spines shorter; tegulæ much darker.....	<i>rufitarsis claripes</i> Ckll.
3. Lower apical teeth of abdomen wide apart, upper ones bifid; axillar spines conspicuously curved; first recurrent nervure	

- entering extreme basal corner of second cubital cell.....
*quercina* Ckll.
- Apical teeth of abdomen not unusually remote, upper ones blunt, not bifid..... 4
4. Antennæ partly reddish basally; axillar teeth large; second tergite with very small foveæ.....*novomexicana* Ckll.
- Antennæ wholly black; axillar teeth shorter; second tergite without foveæ.....*deplanata* Cresson
5. Foveæ on second abdominal tergite, behind transverse furrow, punctiform or absent; hair on eyes short..... 6
- Foveæ on second abdominal tergite linear, transverse..... 7
6. Tegulæ clear red; upper apical spines of abdomen much more divergent than lower.....*salinaria* Ckll.
- Tegulæ dark; upper apical spines of abdomen not more divergent than lower.....*asclepiadis* Ckll.
7. Hair on eyes long.....*ruftarsis* Smith
- Hair on eyes short..... 8
8. Length over 11 mm.; anterior tibiæ black in front except at end.....*mediata* Ckll.
- Much smaller; anterior tibiæ dark or bright red in front..... 9
9. Middle of second abdominal tergite, before groove, shining and sparsely punctured; no spots of light hair between mesothorax and scutellum.....*angulifera* Ckll.
- Middle of second abdominal tergite, before groove, duller and densely punctured; two spots of light hair between mesothorax and scutellum.....*coquilletti* Crawford
10. Upper apical teeth of abdomen tridentate; no transverse foveæ on second abdominal tergite.....*fragariae* Ckll.
- Upper apical teeth of abdomen simple, not divided..... 11
11. Large transversely oval foveæ on second abdominal tergite; hair of eyes long.....*hypodonta* Ckll.
- No foveæ on second abdominal tergite..... 12
12. Larger; hair of eyes long; tegulae black..... 13
- Smaller; hair of eyes short; tegulæ reddish.....*deani* Ckll.
13. Larger; hair of head and thorax above yellowish.....
*ribis kincaidi* Ckll.
- Smaller; hair of head and thorax above dull white.....*ribis* Ckll.

In American Museum Novitates, No. 21 (1921) I remarked that the nearctic *Cælioxys* species seemed to be usually restricted, or nearly restricted, to a single province. The present collection shows that many of the species are more widely distributed, and the California endemism which I expected to find exists only to a very limited extent. Thus, out of fourteen species represented in the collection from California, only two were undescribed.

A NEW LEUCOPIS FROM SAN FRANCISCO

BY J. M. ALDRICH

Associate Curator, United States National Museum

The following species was sent to the National Museum for determination by Mr. Eric Walther of the office of the Park Commissioners, San Francisco:

***Leucopis atrifacies* Aldrich, new species**

Front with dense gray pollen on the sides, median stripe much darker, of nearly equal width to the lunule, about twice as wide as one parafrontal. Ocellar triangle greatly prolonged so as to divide the stripe for most of its length. No ocellar or frontal bristles. Antennæ deep black, the entire face also deep black up to a transverse line at about the lunule. Parafacials also black. Lower part of the head receding, the head rather triangular in profile; back of head plumbeous, this color extending forward a little between the mouth and the eye. Proboscis and palpi black. Thorax densely gray pollinose with rather coarse hairs. Dorsocentrals two pairs, with four erect rows of coarse hairs between them. Abdomen black, with thin satiny gray pollen and no distinct markings. Legs black; femora somewhat pollinose; halteres yellow. Wings subhyaline, slightly gray on the anterior half. The hind cross-vein separated from the anterior one by a little more than the length of the former.

Length: 2.2 mm.

Described from eleven specimens of both sexes, reared by Mr. Eric Walther at San Francisco, California, "in connection with *Thecodiplosis pini-radiatæ*." Four paratypes are being deposited in the California Academy of Sciences.

Type: Female, Cat. No. 28,212, U. S. N. M.

DOLICHOPODIDS, NEW OR IMPERFECTLY
KNOWN

BY M. C. VAN DUZEE

*Buffalo, N. Y.****Asyndetus spinosus* M. C. Van Duzee, new species**

Male. Length, 6.5 mm.; of wing, 5.3 mm.; a large, pale green, white-pollinose species with many spines and wholly yellow legs and feet.

Face, front, palpi, and occiput thickly covered with white pollen, which conceals the ground color. Face nearly as wide as the front. Antennæ black; first two joints with considerable white pollen; third joint small, longer than wide; arista subapical, as long as the antenna. The small black orbital cilia descend nearly to the middle of the eye; below these there is a long, abundant, white beard.

Thorax pea-green, but the ground color nearly concealed with white pollen, which has a slight yellow tinge on the center of the dorsum, probably due to the bronze reflections beneath it. Acrostichal bristles rather small, in two rows; five large dorsocentral bristles in each row; anterior part of the dorsum with many short, stiff hairs; scutellum with one pair of large marginal bristles and a much smaller one outside of these; above each fore coxa is one black bristle and two hairs. Abdomen a little depressed, broad at base, tapering to its apex; pea-green with white pollen, which does not conceal the ground color, its hairs stiff and black, each segment with a pre-apical row of bristles. Hyopogygium nearly concealed, with a number of stiff spines on its posterior surface.

All coxæ blackish, anterior surface of fore and middle pairs with long, stiff, black hairs; posterior pair with an erect bristle on outer surface; trochanters yellow; femora thickened, pea-green with abundant white pollen and rows of stiff, black hairs; fore femora with a row of stout, black bristles on each side of the lower edge, leaving a broad glabrous stripe between them; middle and hind femora with numerous black bristles on lower surface, but these are placed more irregularly; the posterior pair also have a cluster of long, black, bristles at base below; all femora with a few bristles near the tip on upper surface; tibiæ and tarsi yellow; anterior tibiæ with three large bristles on upper anterior edge; beyond these and extending to the tip is a row of short, close-set, bristles or stiff hairs; on the upper posterior edge is a row of hairs and bristles; these rows leave a distinct glabrous stripe between them; middle and hind tarsi with stiff, spine-like hairs. All pulvilli much enlarged, yellow, more brown in the middle, especially at base. Joints of fore tarsi as 40-17-13-10-10, their pulvilli 18, joints of hind tarsi 46-26-19-13-14, their pulvilli 20,

fiftieths of a millimeter long. Calypters, their cilia, and the halteres pale yellow.

Wings nearly hyaline; veins yellow, costa more blackish, except at base and ending abruptly at tip of third vein, which runs close to second; last section of fourth vein almost broken at apical third, where it is bent at right angles, the bend being very thin, thinner than the apical portion of the vein; cross-vein considerably before the middle of the wing and nearly opposite the tip of first vein; last section of fifth vein as long as the basal portion of the last section of fourth vein.

Type, male, No. 1638, Mus. Calif. Acad. Sci., collected by E. P. Van Duzee, June 25, 1921, at **Angeles Bay, Lower California**. Described from the unique type.

This species is remarkable for its large size, pale green color, abundant white pollen, wholly yellow tarsi, and its numerous spines and bristles.

Mesorhaga clavicauda M. C. Van Duzee, new species

Male. Length, 3.5 mm. Face and front shining green, the former a little dulled with gray pollen; palpi yellowish. Basal joint of antennæ black (other joints missing in the type). Orbital cilia white; a few minute white hairs on the vertex.

Thorax and abdomen shining green, in certain lights the posterior slope of the thorax, most of the scutellum and base of abdomen appear deep black; bristles of the thorax black, the tips of some of them white when seen in certain lights. Hairs of the abdomen pale and few, with several minute black hairs among them; venter yellowish, with long, pale hair. Hypopygium shining black, as long as the last two abdominal segments taken together; it has a few white hairs and is obliquely truncate at apex; outer lamellæ about half as long as the hypopygium, brown, fringed with pale hairs, broad at base, suddenly narrowed near the middle, the apex again widened and rounded; penis black, as long as the hypopygium.

Coxæ and femora blackish; fore coxæ and lower surface of femora with long, white hair; trochanters brown. All tibiæ yellow, tips of posterior pair and their tarsi brownish black; fore and middle tarsi yellow, scarcely darkened at tip. Calypters whitish, with very narrow brown tips and long, white cilia. Halteres blackish. Wings nearly hyaline; venation typical of the genus.

Described from one male taken at Muskegon, Michigan, July 4, 1906, by A. C. Hill.

This form differs from *albiciliata* Aldrich, in having all tibiæ yellow; the appendages of the hypopygium longer and brown, the trochanters darker, fore and middle tarsi more yellow and hind tarsi more blackened.

HYDROPHORUS FUMIPENNIS, Van Duzee

Proc. Calif. Acad. Sci., 4th Series, Vol. xi, p. 167.

The original description was made from a single female which was in poor condition. Having seen a fine series of forty specimens of this form taken by Dr. G. D. Hanna and L. Merculioff, on St. George Island, Alaska, in May and September, now in the United States National Museum, I am making a few additions and corrections of the description cited.

Female. Face shining green or bronze-green with a little yellowish pollen below the suture. The fore femora with two rows of spines below, five of which, in the anterior row on basal third of femora, are long; the spines on inner edge of fore tibiae extend from near the base to the tip of the apical angle, which is distinctly produced towards the femora; these spines are as long as, or longer than, those on the femora (except the five long ones mentioned above as being on basal third). Joints of fore tarsi as 20-13-9-8-9; those of middle ones as 35-18-13-10-11; those of posterior tarsi as 45-27-21-10-11. Wings often quite dark brown or blackish-brown.

Male. Color of the face, front, legs, calypters, halteres and wings as in the female; beard yellow and short on lower portion, but black near the neck; two black bristles above fore coxae in most specimens; fifth abdominal segment considerably produced below on apical edge, with a distinct appendage to the hypopygium, extending a little below on its ventral surface; joints of fore tarsi as 22-12-10-8-10; of middle ones as 40-25-20-10-11; first two joints of hind tarsi are as 40-25.

A THIRD RECORD FOR *EMPHOROPSIS DEPRESSA* FOWLER

On April 5, 1925, I took an individual of this large bee at Mill Valley, Marin County, California. It was flying over the ground on a grassy slope as though looking for a suitable hole in which to establish its nest. On page 49 of this volume of the *Pan-Pacific Entomologist*, Professor Cockerell reports a specimen taken by Dr. E. C. Van Dyke as the second recorded occurrence of the insect.—E. P. Van Duzee.

ON THE GENERA OF CIXIIDÆ, MEENOPLIDÆ
AND KINNARIDÆ

BY F. MUIR

Honolulu, T. H.

(Continued from Page 110)

The Genera of Cixiidæ

The family Cixiidæ, as above restricted, contains about seventy-four genera at the present time, and as these insects have been given comparatively little attention by collectors in the tropics, where they are most numerous and diverse, the number is likely to be greatly increased. As the least specialized of the five families which appear to be descended from a similar type (Cixiidæ, Delphacidæ, Tropiduchidæ, Derbidæ, and Achilixiidæ), the classification of the genera of this family is of considerable interest, and the recognition of the lines of evolution among them may be of help in understanding the lines of evolution among the genera of allied families. Among these five families we find some male genitalia which approach the meenopolid type, but the difference is generally recognizable and, as a rule, they are specialized representatives of families whose generalized forms have typical cixiid types of male genitalia. As an example, the Delphacinæ can be cited; these often have a ring at the base of the ædeagus which may be the periandrium, but they are descended from the Asiracinæ, which have a typical cixiine genitalia.

No attempt has been made to tabulate all the genera of Cixiidæ since 1866, when Stål mentioned most of the then known genera, Fieber's work being confined mainly or entirely to European genera; it is, therefore, apparent that an attempt should be made to list and classify them. Stål's classification has been followed by nearly all subsequent workers. His first division segregates the Meenoplidæ of the present paper; his second and third divisions segregate a few forms without carinæ on the clypeus or with longer antennæ than normal, and are purely artificial. His fourth division is based upon the presence or absence of spines on the hind tibiæ before the apex. It is unfortunate for systematists that these spines are not dependable, as there are too many genera in which they are obscure, and one cannot say whether spines should be consid-

ered as present or absent. Again, the use of these characters bring together forms widely separated on general morphological grounds, and separates others which are closely allied. But until the morphology of the family is much better understood, we find this last disadvantage in any dichotomous table that may be drawn up.

The writer's conception of the most primitive cixiid is one in which the tegmina and wings are fairly large, tectiform when at rest, with C coincident with the costal margin, Sc, R, M, and Cu all arising separately from the basal cell or only touching at their bases and not forming a stalk; the body compressed laterally with a well-developed ovipositor in which the anterior and middle gonopophyses or styles are co-ordinated and work together as a simple organ, the ovipositor, with the posterior styles acting as a sheath for them when at rest; the female pygofer not much longer than wide and not flattened into a large surface bearing wax glands; the median ocellus present. The genus which appears to approach nearest to this theoretical types is *Andes* Stål, and after that *Parandes*, *Melandeva*, *Brixidia*, *Brixia*, *Southia*, *Benna*, and *Bennaria*, with the *Pintalia* group gradually passing through the *Ptoleria* into the *Cixius* group, in which the body is horizontally flattened, the tegmina but slightly tectiform, the ovipositor incomplete or abortive, the female pygofer flat, wide and secreting long filaments of wax. In the *Andes* group we find three conditions of the Sc, R and M, viz.: (a) All three arising separately from the basal cell, (b) Sc + R forming a stalk, and (c) Sc + R + M forming a stalk; in the *Cixius* group we find only the second and third conditions. It is to be regretted, for taxonomic reasons, that the main dichotomy of the family cannot be made between these two groups, but there are some forms that are intermediates and make it difficult to define. In both these groups the tend of evolution has been towards the joining together of the bases of the veins, Sc, R and M, sometimes accompanied by a slight stenogenesis; in no case is there a great platygenesis, and in no case is there a costal area with transverse veins.

Four genera have been segregated off as a tribe, Bothriocerini, and if *Kinnara* be retained in the Cixiidæ it should be

placed with them. These possess a subantennal plate or the antennæ are sunk into a pit. *Euryphlepsia* and *Stenophlepsia* are closely allied genera; *Bothriocera* and *Borysthenes* are not so closely allied, and both are considerably different from the former two; the tribe may only be one of convenience.

The Genera of Meenoplidæ

The eleven genera forming this family are all closely related and form a homogeneous and, evidently, a monophyletic group. They require a careful revision, as the characters upon which they are founded are very slight. At present the writer is unable to separate *Anigrus* and *Inxwala*, *Kermesia* and *Eponisia*, *Robigalia* and *Nisia*.

The species are all fairly thick-set and small, with the tegmina, when at rest, tectiform, the veins fairly thick, the clavus granulate, and very often the Sc + R also granulate. M3 + 4 is often in contact with Cu 1. A median ocellus is nearly always present, or a scar represents its position. The male genitalia have the perianthrium large, more or less funnel-shape, with the penis tubular and passing through the perianthrium, with a large apodeme of the penis. The ovipositor is incomplete, the posterior styles (sheath of ovipositor) short, broad, subquadrate, the median and anterior styles (ovipositor) very small or missing. The pygofer does not secrete wax, but this is done by some of the abdominal tergites, a condition also found in *Kinnara*. This type of female genitalia is very different from the Cixiidæ, and is nearer to Flatidæ and the other families with the meenoplid type of male genitalia.

Kinnaridæ

This family is represented by the one genus, *Kinnara* Distant.

Head distinctly narrower than thorax. Vertex small, about as long as broad, base straight or but slightly emarginate, divided from frons by a straight, transverse carina which is sometimes obscure. Frons longer than broad, sides arcuate, broadest in middle, lateral carinæ large, with a small, clear spot (fenestra) in front of antennæ, no median carina, in lateral view edge of frontal lateral carinæ slightly sinuous. Clypeus tricarinate, the lateral carinæ continuing from the frons; labium reaching nearly to apex of abdomen, apical segment long. Eyes a little wider than deep, antennal sinus small, three distinct ocelli. Antennæ small, globose; subantennal process present in the shape of a strong ridge across the gena, with a smaller one at

right angles to it and between it and the antenna. Pronotum very short, hind margin widely emarginate. The lateral carinæ following the hind margin of eyes and reaching the hind margin in front of tegulæ; mesonotum wider than long, tricarinate, the carinæ sometimes obscure. Legs slender, hind tibiæ unarmed.

Tegmina fairly broad, tectiform, the apical margins generally touching when at rest. Sc and R forking near middle of tegmen in most species. R joining M for a short distance before Mf and looking like a part of M system; M arising from basal cell or from base of Sc + R, but does not form a stalk, with three or four apical veins, Cu normal; claval veins joining near apex and entering suture at or near apex, without granulation; costal cell broad, the stigma large.

The male ædeagus consists of an outer tube, the periandrium, and an inner tube, the penis, which passes through the periandrium. The female ovipositor is incomplete, the styles being small; the pygofer is small and obscure and appears to bear no wax-secreting gland, but this function is taken on by the sixth, seventh, and eighth tergites, which are large and bear wax-secreting glands.

This is an anomalous genus, and it would be good if it could be placed elsewhere, but no other existing family could contain it. The male and female genitalia place it among the meenopline group of families. The claval vein joining the suture at apex is a character which should take it from the Cixiidæ.

Kinnara albiplaga Dist. does not belong to this genus, but to *Suva* Kirk.

Remarks on Certain Genera

Akotropis Mats. If Matsumura's figure of the tegmen of *Akotropis fumata* be correct, this should not be an Achilid, but more likely a Cixiid.

Aulocorypha Berg. The writer is unable to place this genus in this table. The genus *Cixiosoma* Berg has been placed there with great doubt as to what it really is. The absence of the median ocellus would indicate that they do not belong to the Cixiidæ.

Betacixius Matsumura. The writer is not acquainted with this genus, either by specimens or the description.

Bodecia Walker. The type material of this genus is in the British Museum and consists of a single mutilated specimen with the abdomen missing. The head belongs to a Delphacid, evidently *Ugyops*, and has been gummed onto the thorax, which belongs to *Mnemosyne*. Neither the head or tegmina agree with the description. The antennæ are described as very short,

whereas the specimens have long, cylindrical antennæ of *Ugyops*. The description does not allow it to be placed in the table. We must await the finding of locotypes which agree with the description.

Calcerda Signoret. The writer is not acquainted with this genus.

Cyphoceratops Uhler. The writer has not seen this genus, and the description leads him to think it is not a Cixiid. The description of the hind tibiæ having "a stout, long spur at tip" would indicate that it is a Delphacid.

Eucarpia Walker. The type of this genus is a damaged specimen in the British Museum. It comes very near to *Ptoleria* Stål, but the writer is loath to sink the latter until it has been shown that it is necessary.

Eudelphax Melichar. An examination of the type *Eudelphax setulosus* shows that it belongs to the Delphacidæ, and is the same as *Eodelphax serendiba* Kirkaldy. The type specimen is damaged, but one hind leg is present and it bears an awl-shaped apical spur that shows it belongs to the subfamily Asiracinæ. The specimen bears Kirkaldy's type label, and also Melichar's label, *Eudelphax setulosus*.

Ipsnola Sign. This genus was placed in "*Achilides* Stål," but was compared with *Cixius*. The description does not allow the writer to place it in either the Achilidæ or Cixiidæ with any certainty. The location of the type specimen is not known to the writer.

Macrocixius Matsumura. The writer is not acquainted with this genus, either by specimens or the description.

Monorachis Uhler. The writer only knows this genus by the original description, Van Duzee's¹ remarks upon it, and Metcalf's² figures of the head and thorax. Not knowing the condition of the tegmina, he is unable to place it in his table. The frons is as broad as long and nearly round.

Nesomyndus Jacobi. The writer is unable to place this genus in his table. It is stated to be near *Myndus*; the base of vertex is more deeply angularly emarginate, and there is no trace of a transverse carina before the apex.

Prosops Buckton. The type of this genus is in the British

¹ Proc. Acad. Nat. Soc. Philadelphia, 1907 (published 1908), p. 484.

² Jour. Elisha Mitchell Sci. Soc. (1923), XXXVIII, Pl. 54, figs. 278, 279.

Museum, and is mounted on a glass microscope slide. There appear to be no characters to separate it from *Oliarus*.

Prosotropis Uhler. The type specimen of this species could not be traced in the British Museum. It was compared by Uhler to *Cercopis*, and the description does not enable the writer to place it in the table. In the United States National Museum there is a specimen labeled "*Prosotropis decorata* Uhler," evidently in Uhler's handwriting, and it may be a cotype. The specimen is in a bad condition and gummed on a card, and belongs to the Delphacidæ, apparently a *Delphacodes*.

Tiriteana Myers. The writer has no specimens of this genus, and several characters are omitted in the description which prevents him from placing it in his table.

The following genera belong to the Achilidæ: *Chronoba* Distant; *Clusivius* Distant; *Taloka* Distant; *Hamba* Distant; *Amblycratus* Uhler; *Cionoderus* Uhler.

Oliarus Stål. Kirkaldy erected two subgenera in this genus, one, *Nesoliarus*, to contain all the Hawaiian species, and another, *Nesopompe*, to contain one Australian and one Fijian species, *felix* and *saccharicola*. The first is purely a geographical subgenus and is of great convenience, as it segregates a number of species, varieties and forms, which are closely allied and monophylatic; among them we find some forms that could go into the typical subgenus *Oliarus* and others into *Nesopompe*. Kirkaldy erected the genus *Mesopompe* upon the characters found in the spines on the first and second hind tarsal joints (not tibiæ as stated in his table). The writer considers *felix* and *saccharicola* to be the same species; it has an undivided fosette, the transverse carina being curved, and there is no carina joining it to the carina at apex of vertex. The writer would consider this as the better character to erect the subgenus upon. All the New Zealand and some Malayan species would then come into this subgenus.

New Genera and Species

Olonia Muir, gen. nov.

Width between the posterior angles of vertex greater than length along middle line; apex strongly angular and carinate, base angularly emarginate, the angle subequal to apex, width between apical angles of the vertex less than between basal angles, sides nearly straight, diverging posteriorly, a medio-longitudinal carina runs from base to

near apex, but does not join apical carina. Clypeal suture obscure, frons and clypeus appearing as a single body, sides arcuate, elevated, especially about level with median ocellus, where frons is widest; median carina simple, distinct, continuing unbroken through frons and clypeus. Antennæ small, second segment about as long as broad; no carina across gena below eyes. Labium reaching slightly beyond hind coxæ, apical segment long. Pronotum nearly perpendicular in the middle, fitting into the base of vertex, very short, mostly covered by head. Mesonotum about as wide as long, tricarinate, outer carinæ straight, slightly diverging posteriorly. Hind tibiæ without spines. Ovipositor complete, long, projecting considerably beyond pygofer, which is a little longer than wide. Tegmina long, about three times the width beyond clavus, where it is widest. Sc + R and Cu forks less than one-third from base, Mf distad of middle, 3 Rs and 5 Ms, M1a present. Claval vein entering commissure a little before apex. The insect is fairly narrow and the tegmina fairly tectiform, the hind margins coming together when at rest.

Type *Bothriocerodes metallicus* Fowler.

Colvanalia Muir, gen. nov.

The type of this genus is a species of Walker's in the British Museum labeled *concinnulla* Walk, Sula, and appears to be *Brixia concinnula* Walk. (Jl. Linn. Soc. Lond. Zool., X, 1868, p. 110.)

Width of vertex at base equal to length, twice the width of apex, slightly arcuately emarginate, apex slightly angular, sides nearly straight, slightly carinate, no longitudinal or transverse median carina; frons about as wide as long, narrowest at base, broadest near apex, ocellus distinct, median carina present, but obscure, sides slightly carinate; clypeus obscurely tricarinate. Sc + R forking about one-third from base, Cuf more distad, but before apex of clavus, Mf about level with node; 2 Rs, M arising from basal cell with five apical veins: M1, 1a, 2; 3, 4.

Nothocharis Muir, gen. nov.

Width between basal angles of vertex considerably greater than length in middle and 2.3 times width at apex, sides nearly straight, deeply carinate, base arcuately emarginate, disc excavate, a distinct medio-longitudinal carina. Frons considerably longer than broad, narrowest at base, gradually increasing to near apex, then decreasing, the sides straight on basal half then arcuate, width at apex slightly more than twice the width at base, carinæ on sides and in middle distinct; median ocellus obscure, only represented by a minute scar. Clypeus tricarinate, continuous with carinæ of frons. No carina across gena below antenna. Eyes with a small antennal sinus. Antenna small, second segment globose. Pronotum short, hind margin deeply and angularly emarginate, tricarinate, the lateral carinæ nearly

straight, diverging posteriorly, reaching hind margin. Mesonotum compressed laterally, tricarinate, about as long as broad. Tegmina fairly tectiform, apices touching or almost touching when at rest; Sc + R forking near to basal cell; M arising from basal cell, Mf slightly basad of apex of clavus; Cuf about middle of clavus; eleven apical veins, Sc 1, 2; R 1, 2; M 1, 1a, 2, 3, 4; Cu 1, 2. Hind tibiæ without spines. Ovipositor complete, pygofer longer than wide.

Type *Nothocharis bakeri*.

***Nothocharis bakeri* Muir, sp. n.**

Female. Length, 2.8 mm.; tegmen, 3.7 mm.

Carinæ of head yellow fuscous brown between carinæ, antennæ light brown, pronotum and mesonotum dark brown or black, carinæ yellow, posterior angle of mesonotum yellowish; legs light, anterior and middle tibiæ banded; abdomen dark brown. Tegmina light at base, fuscous over the rest with nine hyaline marks in apical cells between Sc and M 4; veins same color as membrane, granules small and obscure. Wings hyaline, slightly fuscous, with brown veins.

Described from one female from Baguio, Benguet, Philippine Islands (*C. F. Baker*). This genus comes into a small group between 13 and 20 in the table. Type, No. 1165.

***Nothocharis tayabasensis* Muir, sp. n.**

Female. Length, 3 mm.; tegmen, 4 mm.

This species differs from the genotype, in having the Sc strongly bent inward at the stigma, and Cu strongly bent towards M 3 + 4, which it touches for a short distance.

Stramineous; slightly fuscous at base of frons and on vertex between carinæ, dark brown between carinæ of mesonotum. Tegmina hyaline, stramineous, dark brown over apex of clavus, apical portion of Cu and M 3 + 4, with four raised, shiny, white spots, one on Cu 2, one on Cu 1, and two on M 3 + 4. Apical cells very slightly fuscous, with lighter areas in apical cells; veins same color as membrane. Wings slightly fuscous, veins brown.

Described from one female from Malinao, Tayabas, Philippine Islands. (*C. F. Baker*, No. 10,003). Type, No. 1166.

ADDENDA TO NOTES ON SOME SPECIES OF
LEPIDOPTERA IN RELATION TO THE
STRETCH COLLECTION

BY WILLIAM BARNES AND F. H. BENJAMIN

Decatur, Illinois

EPICNAPTERA AMERICANA (Harris)

1841, Harris, Rept. Ins. Mass., p. 273, *Gastropacha*.

ilicifolia (Auct. nec. Linn.)

1797, Abbot & Smith, Lep. Ins. Ga., I, 101, pl. LI (biol.), *Phalæna*.

occidentis (Wlk.)

1855, Walker, Cat. Lep. Het. B. M., VI, 1392, *Gastropacha*.

carpinifolia (Bdv.) (partim.)

1868, Boisduval, Ann. Soc. Ent. Belg., XII, 83, (partim.), *Lasiocampa*.

form FERRUGINEA (Pack.)

1864, Packard, Proc. Ent. Soc. Phila., III, 386, *Gastropacha*.

race CARPINIFOLIA (Bdv.) (partim.)

1868, Boisduval Ann. Soc. Ent. Belg., XII, 83 (partim.) *Lasiocampa*.

form CALIFORNICA (Pack.)

1872, Packard, Rept. Peab. Acad., IV, 91, *Gastropacha*.

form MILDEI (Stretch)

1872, Stretch, Zyg. & Bomb. N. Am., pp. 113, 240 (pl. IV, f. 12),
Gastropacha.

roseata (Stretch)

1872, Stretch, Zyg. & Bomb. N. Am., p. 240, pl. IV, f. 12, *Gastropacha*.

race? ALASCENSIS (Pack.)

1872, Packard, in Stretch, and Stretch, Zyg. & Bomb. N. Am., p. 114,
Gastropacha.

race DYARI (Rivers)

1893, Rivers, Can. Ent., XXV, 114, *Phyllodesma*.

This species presents a number of much discussed and little known names, two of which were put into print by Stretch. The species, with its races and forms, appears to be very generally distributed throughout the United States and probably throughout Canada and Alaska, except for the coldest portions. The Barnes collection possesses 120 specimens from Pa., Ohio, Ill., Wisc., Utah, Colo., Nev., Ariz., N. Mex., Calif., Ont., Man., Alta., B. C., Vanc. Is., and Alaska, while Abbott and Smith figure it from Ga., and *dyari* was described from Texas.

The species seems subject to a wide range of variation in color and maculation in every locality. In fact, it is difficult to obtain two specimens which are identical.

With ten names assigned to this species, it is best to eliminate some of these before proceeding further.

Illicifolia of Abbot and Smith is presumably an erroneous identification of Georgia specimens as identical with the European species. Spuler's figure of the larva of European *illicifolia* (Raupen, pl. XVIII, f. 6) is quite distinct from a larva before us labeled "*E. americana*." In fact, the larva of *americana* appears to be more like that of *tremulifolia* as figured by Spuler (Raupen, pl. XVIII, f. 5), but apparently distinct. The two European species were much confused during the time of Hübner, and it is quite likely that Abbott and Smith were calling *illicifolia*, *betulifolia* and *tremulifolia*, *illicifolia*. Be that as it may, the American species is apparently distinct from European species; "*illicifolia* A. & S." is based on a misdetermination and is, therefore, unavailable.

The name *occidentis* Wlk. described from North America may be referable to any of the forms. We do not know what Walker's type looks like and leave the name as placed by prior workers.

The name *ferruginea* appears to be based on ferruginous colored specimens of *americana*.

The name *carpinifolia* was described from a single specimen taken by Lorquin in the woods of California, and also from Abbot and Smith's plate of "*illicifolia*." Boisduval did not, to our knowledge, apply name to, and describe from, figures of other authors unless he possessed actual material. This actual material we would consider, therefore, has a better claim to hold the name proposed than an erroneous reference to some other work or a part of a description drawn therefrom. This idea is rather universally accepted in regard to Linnean specific names, and we see no reason why it should not be applied to subsequent authors. We are quite certain that if we were to publish a name based on material before us, to erroneously assign to the synonymy a misidentification of a prior author and to amplify our description by including early stages described by that author, we would not be pleased to have another

author restrict our name to any form or species which we did not actually possess when we wrote.

If, then, *California americana* should possess a racial name (we are dubious about that point) it would appear that *carpinifolia* Bdv. was the oldest name available based on West coast material. *Californica* Pack. will probably become a synonym, but not having examined Boisduval's type, we propose to list *californica* as a color form. It is always easier to sink a name than to resurrect one. We note that, in general, West coast material appears to have less white contrasts on the primaries, although some Eastern specimens, especially those referable to *ferruginea* lack white contrasts. A specimen compared with the single type of *californica*, at Cambridge, by Dr. McDunnough, indicates a form similar to *americana*, but with less white contrast on the primaries.

The names *mildei* and *roseata* were both assigned by Stretch to the same specimen, a male, Coll. J. Behrens. In the text, page 113, *mildei* is used, but the "explanation of plate 4" gives *roseata*, which is, however, "corrected" on page 240 to *mildei*. The name *roseata* is actually published in connection with the figure. It appears to be neither a lapsus calami nor a typographical error. The Code does not seem clear in regard to what to do with such names. Even if not credited to the original author who has created them "in error," they would apparently be available because of adoption combined with descriptions and indications by subsequent authors. It seems sensible to "credit" *roseata* to Stretch (1872) rather than to some other authorship, say Neumoegen and Dyar (1894, Jour. N. Y. Ent. Soc., II, 153), who adopt it. Certainly, Stretch was the first to recognize that his names were synonymous and has definitely selected the name *mildei* in his attempt to eliminate the name *roseata*. We, therefore, follow him in this, but retain the name *roseata* in the synonymy. Unfortunately, the name represents an intermediate form, lacking all white on the primaries which are red, with the terminal space darkened by gray. Temporarily, we retain *mildei* as a form name. It is, however, a Behrens manuscript name, according to Stretch, and if Opinion 78 of the International Commission be followed, may ultimately have to be credited to "Behrens in Stretch." Personally, we prefer to follow the actual wording of the Code, credit to Stretch as the

first author publishing the name "in connection with" a description, and avoid an awkward authorship of no practical value.

The name *alascensis* must be added to our lists. It is probably one of Packard's names which were to be published in the papers destroyed by the Chicago fire. We understand that some few separates were sent out, that Mr. Nathan Banks possesses one of these, and Stretch presumably had a copy or at least access to Packard's description as he publishes a quotation, enough, we believe, to hold the name and authorship which he credits to Packard; "uniformly dark chestnut-brown, much as above; with the outer band distinct, and with large triangular dusky spots between the venules." By contrasting *mildei* to *alascensis*, Stretch has also published the name. In this case, it appears to us that Article 21 of the Code indicates that authorship can rest with Packard. Had Stretch not put quotation marks around some of the words, we would consider that Article 21 required the authorship to be "Stretch." While the description of *alascensis* is nomenclatorily adequate, it is taxonomically inadequate, so we retain the name as a race of *americana* until either the type can be found or sufficient Alaskan material can be obtained to guess at its status.

The name *dyari* appears applicable to a race or perhaps a distinct species inhabiting Texas, New Mexico, and Arizona. It is somewhat larger and paler than *americana*, although some California specimens appear to be intergrades as far as color. The White Mountains of Arizona produce a form of *americana* which is similar to Colorado material. The differences between the Eastern and West coast races of *americana* is so slight and evanescent, that we are quite at a loss to know how to place specimens from Arizona, Colorado, Utah, Alberta, and Manitoba.

A single wreck of a specimen, its pin bearing one label, "298 *Gastropacha mildei* California," is in the Stretch collection. We believe the label must somehow have gotten onto this pin in error. Stretch's figure plainly represents an *Epicnaptera* (*Gastropacha*), but the labeled specimen is pale-colored, twice as large as the figure, and presumably represents some exotic species of Lasiocampid not belonging to the genus *Epicnaptera*. It had evidently once been papered, the abdomen being greatly flattened.

At our request, Mr. Van Duzee has again gone over the unlabeled material in the Stretch collection, in search of a specimen agreeing with the figure of "*Arachnis*" *semiclara* Stretch. Through his efforts, another obnoxious "unplaced name" can now be determined.

ECPANTHERIA SUFFUSA (Schs.)

- 1889, Schaus, Ent. Amer., V, 190, *Arachnis*.
1892, Kirby, Syn. Cat. Lep. Het., I, 219, *Arachnis*.
1897, Druce, Biol. Centr.-Amer., Lep. Het., II, 378, pl. LXXV, f. 11, *Arachnis*.
1901, Hampson, Cat. Lep. Phal. B. M., III, 386, text fig. 162, *Ecpanteria*.
1924, Barnes & Benjamin, Contr. N. H. Lep. N. A., V (3), 105, *Ecpanteria*.
semiclara (Stretch).
1906, Stretch, Jour. N. Y. Ent. Soc., XIV, 124, pl. XII, f. 18, *Arachnis*.
1906, Dyar id., XIV, 124, footnote, ? near *suffusa*, *Ecpanteria*; ? = ♀ *albescens*, *Arachnis*.
1924, Barnes & Benjamin, Contr. N. H. Lep. N. A., V (3), 105, ? = *suffusa*, *Ecpanteria*; *Arachnis*.

The species was recorded from the Baboquivari Mountains, Pima County, Arizona, by B. & Benj., 1924, on the strength of 2 ♂, 1 ♀ sent by Mr. O. C. Poling. Since then, we have received from the same locality and collector additional specimens, now making a total of 13 ♂, 3 ♀. The species is a very variable one, and no two specimens before us are absolutely identical.

A single ♂, labeled with only a small, round, white pin label bearing the number "649," is in the Stretch collection. The medial spurs of the hind tibiae being absent, the specimen falls into the genus *Ecpanteria*.

This specimen has the fore wings practically identical with Stretch's figure, but the hind wing shows a very slight amount of black along the outer margin. The black discal spot and the black costal spots are as illustrated. An examination of the figure shows that it is, apparently, not accurate, as the maculation of the two primaries is drawn somewhat differently in the more minute details. The amount of black on the outer margin of the hind wing of the Stretch specimen is so small that we are inclined to think it was overlooked by the artist. In fact, it has

been practically lost on the right secondary, which is somewhat rubbed.

In view of the existence of the single specimen in the Stretch collection; the extreme variability of the species, most specimens of which would not agree at all well with the Stretch figure; and the practical agreement of his specimen with his figure, we are of the opinion that we have the true type before us. If this specimen be not the type, then it agrees so well with the figure that there seems no reasonable doubt as to what species the figure represents.

As for our determination of this species as *suffusa*, this also seems beyond reasonable doubt, as Dr. Schaus has been kind enough to compare some of our specimens with his type.

TROPISTERNUS SALSAMENTUS Fall (Coleoptera)

This rarely collected species was first described from specimens taken from a small salt lake just back of the ocean beach at Redondo (type locality), California. At that time about a dozen specimens were collected in April and July by Dr. A. Fenyès. Mr. J. O. Martin has taken it at San Diego, California, August 19, 1917. Mr. Warwick Benedict took several at Ensenada, Lower California, July 19, 1924. Recently I have seen a specimen in the collection of Mr. Vasco M. Tanner that was secured at Redwood City on San Francisco Bay, Santa Clara County, California, June 15, 1922. This record extends the known range of distribution of this species quite a distance north of the type locality.—Frank E. Blaisdell.

NEOCLYTUS CARUS AND MODESTUS

During the months of June and July, 1924, I reared a number of *Neoclytus* from oak which I had secured during the preceding winter in Eaton Cañon, near Pasadena, California. Approximately half of these were gray and white, and the remainder yellow and black. These were identified by Dr. Van Dyke as *N. modesta* Fall and *N. carus* Fall. I repeatedly observed copulation between these insects, and always between a gray and a yellow, the latter being the female. Dissection of several of each shows male organs in the gray form and female organs in the yellow form. From this it seems that *N. carus* Fall is the female of *N. modestus* Fall.—A. C. Davis.

NOTES AND DESCRIPTIONS OF NEW SPECIES OF
WEST AMERICAN HISPINÆ (COLEOPTERA-
CHRYSOMELIDÆ)

BY EDWIN C. VAN DYKE

University of California, Berkeley

The Hispinæ, because of their colors and neat appearance, have always been considered as one of the most attractive groups of the leaf-eating beetles. They are interesting biologically, for their larvæ are either true leaf-miners or work between the approximated surfaces of the young unfolded leaves.¹ Many of the old world species are quite destructive as, for instance, some which feed on the leaves of the bamboo and rice, and a number of ours are also of economic importance, as will be shown by the remarks of Mr. W. W. Jones and Mr. H. R. Brisley following mine. As the result of a recent study of our species, I am making known a number of undescribed forms, and reporting a few facts concerning others.

Anisostena californica Van Dyke, new species

Elongate, subcylindrical, black, upper surface, especially the elytra, a deep metallic blue; antennæ black. Front of head with a fine median and a coarser longitudinal groove at the inner margin of each eye and rather coarsely punctured, the punctuation extending well up onto the vertex; antennæ slightly longer than head and prothorax together, third joint just perceptibly longer than the second but narrower, fourth, fifth, and sixth gradually increasing in breadth, the next five forming an elongate cylindrical club. Prothorax distinctly longer than broad, with sides practically parallel, subcylindrical, deeply, coarsely, closely, and irregularly punctured, quite reticulate laterally. Elytra one-third broader at base than prothorax, three and a quarter times as long as prothorax, with sides almost parallel, the margin sinuate when viewed laterally, regularly rounded at apex and minutely serrulate apically; disc with a scutellar and eight rows of deep and regular punctures, the sutural and alternate intervals elevated and costate. Mesofemora with a row of basal serrations within. Length, 4.5 mm.; breadth, 1.75 mm.

Type (No. 1639, Mus. Calif. Acad. Sci.), and five paratypes in my collection captured by myself on a species of reedy grass in the wet meadows on the floor of the **Yosemite Valley, California**, May 22, 1921. I also have seven more specimens in my collection from the following localities: Castella, Castle Crags

¹ Biologia Centr. Amer. Insecta, Coleoptera, Vol. VI, Pt. 2, p. 1.

and Shasta Springs in Siskiyou County, California, and Carrville, Trinity County, California, all collected during the months of June and July.

This species closely resembles the bluer phases of *Anisostena perspicua* Horn, agreeing with that in having the middle femora serrate within, but it differs by being somewhat smaller, always decidedly blue, with the front of the head deeply punctured, not merely granular as in *perspicua*; joints four to six of antennæ decidedly transverse, not longer than broad as in the other, with the base of prothorax not transversely depressed, and the elytra not emarginate at the apices. From *Anisostena funesta* Baly. it differs by possessing the middle femoral teeth, by not being black, by having the front profoundly punctured, the intermediate joints of the antennæ all decidedly transverse, the punctuation of pronotum more definitely cribrate and the alternate elytral intervals more costate.

BRACHYCORYNA (ODONTATA) HARDYI (Crotch) ²

This name should replace *Brachycoryna horni* Weise (*melsheimeri* Horn) in our lists. In separating the California species from the Pennsylvania *melsheimeri* (Cr.), Weise seems to have overlooked the fact that Crotch had already done that. *Brachycoryna hardyi* (Cr.) is a common and widely distributed species in California, living upon various species of *Ceanothus*, or wild lilac, often in company with *Baliosis californicus* (Horn). It varies somewhat in the different parts of its range, the specimens from the Sierra Nevada being as a rule the largest and most elongate, with the elytral punctures very large, less regularly disposed and with a tendency to become confluent. The Southern California forms are shorter and with the rows of elytral punctures more regular, while those from the San Francisco Bay region are perhaps more rufous, with the elytral punctuation the most regular and the intervals the most definite. Specimens of the last were seen to be so different from the Sierran forms, that I was inclined to consider them distinct until I compared them with others of a more intermediate type.

***Brachycoryna dolorosa* Van Dyke, new species**

Robust, coal-black, subopaque, legs somewhat nigro-rufous. Head in front, with the usual median and lateral oculo-marginal grooves,

² Trans. Am. Ent. Soc., Vol. V (July, 1874), p. 80.

punctate granular, antennæ slightly longer than prothorax, club elliptical and compact as usual. Prothorax broader than long, sides straight and parallel for posterior two-thirds, convergent anteriorly; disc coarsely, irregularly and cribrately punctured; intervals minutely granulate. Elytra less than twice as broad as prothorax, over three times as long, and itself somewhat less than two-thirds as broad as long, broadest posterior to middle; sides hardly sinuate back of the humeri, slightly arcuate and evenly rounded to apices; margin very finely serrulate; disc convex, a series of three punctures at the side of the scutellum, then four double rows of coarse punctures, the third with a short series of punctures interposed (a double row interposed in a few specimens); sutural and alternate intervals distinctly elevated and costate, the entire surface minutely granulate like the pronotum. Length, 4 mm.; breadth, 1.75 mm.

Type (No. 1640, Mus. Calif. Acad. Sci.), and three designated paratypes from a series of nine specimens belonging to the California Academy of Sciences, collected by Mr. E. P. Van Duzee, at **Millbræ, San Mateo County, California**, August 17, 1919, on wormwood. I have in my own collection a specimen similar to the above, and secured at Burlingame, San Mateo County, California, July 10, 1909, and another collected at Berkeley, California, May 20, 1919, this last specimen being more or less irregularly blotched with yellow, thus as regards its color pattern approaching *Brachycoryna hardyi* (Cr.). It, however, has all of the physical characters of the typical all-black forms.

This species differs from *Brachycoryna hardyi* (Cr.) by being generally more robust, both prothorax and elytra proportionally broader, by the color in typical specimens, the dull appearance in contrast to the shining of the other, by the more transverse intermediate antennal joints, the definite and regular elevation of the alternate elytral intervals, the discal ones in the other but little if at all elevated, the more regular arrangement of the punctures as well as better separation (this last character not so evident when comparisons are made with the coastal phases of *hardyi* (Cr.)), and the less evident marginal serration. From *Brachycoryna montana* (Horn), to which it is evidently more closely related, it differs by being very much larger and more convex, by having the elytral punctures smaller and less crowded and the second and fourth intervals more elevated and straighter. In *montana*, the intervals are quite sinuate.

MICRORHOPALA RUBROLINEATA Mann.

This species has been known for years to have a tendency to vary as to its color pattern, but no one has noted particularly that these phases were more or less definite geographical races. This can be best shown by presenting them in tabular form.

Thorax with narrow yellow band near outer margin.

The yellow band continued on to the elytra and along the fifth elytral interval almost to apex. Found throughout much of Arizona (Chiricahua Mountains) and most of Southern California.....*rubrolineata* Mann.

The yellow band absent from elytra. Found only in the hotter and drier parts of Southern California, as at San Diego, Palm Springs, and El Cajon, and extending northward along the drier parts of the Coast range to Tasajara Hot Springs in Monterey County, and along the western flanks of the Sierra Nevada to Tuolumne County.....

.....*rubrolineata* var. *signaticollis* Lec.

Thorax with yellow area so extended that the pronotum is all yellow, with the exception of a narrow median area; the elytral vittæ greatly broadened at basal area, extending from the third stria to beyond the seventh interval, more or less enclosing the humeral umbone, and absolutely lacking posterior to the middle. Found in Siskiyou and Trinity Counties, California

.....*rubrolineata* *militaris* n. var.

Thorax without yellow markings.

Yellow markings of elytra very broad, extending from second interval to near lateral margin and, as in the preceding phase, confined to the anterior half of the elytra. Found in Arizona (Yavapai County).....*rubrolineata* var. *vulnerata* Horn

The type (No. 1641, Mus. Calif. Acad. Sci.) of the variety *militaris* is a specimen collected by myself in **Siskiyou County, California** (presumably Upper Soda Springs), some years ago. Two paratypes in the collection of the California Academy of Sciences were secured by Mr. E. R. Leach, in Trinity County, California, March 22, 1917.

The *Microrhopala cyanea* Say of Colorado, probably the typical form, is a moderately large insect, at least 6 mm. in length and of a deep amethyst or bluish-purple color. There is a variety in Arizona, of which I have a specimen, that is only 5 mm. in length and of a brilliant greenish-blue color, contrasting quite markedly with the more typical form.

FIELD NOTES CONCERNING A FEW
ARIZONA HISPINÆ

BY WYATT W. JONES AND HAROLD BRISLEY

Chalepus ater Weise. Larvæ and pupæ found in large blotch mines, in leaves of the common cultivated bean during late August, 1924, in the Sulphur Springs Valley, near Douglas. Adults appeared within a few days after taking the tenanted mines. Though the mines were numerous, the amount of actual damage could not be determined because of the greater injury produced by the bean ladybird beetle, *Epilachna corrupta* Muls. Mr. E. P. Van Duzee reports a plot of beans belonging to Mr. Biedermann, in the Huachuca Mountains, partially destroyed this summer by this Hispinid. Mr. Biedermann stated that he had not previously noted the species on his place, though he had been growing beans for a number of years.

Baliosis californicus (Horn). August 21, mined leaves occupied by larvæ and pupæ were taken from *Ceanothus fendleri* Gray at elevations ranging from 5500 to 6000 feet near Prescott. Though the leaves of this plant are commonly very small, the tissue of a single leaf was seldom completely consumed by one specimen. The mines were numerous locally, but were not generally distributed. Adults emerged from the mines soon after the specimens were taken.

Microrhopala rubrolincata var. *vulnerata* Horn. While collecting mined leaves of *Solidago californica* Nutt. near the summit of Mingus Mountain, 7500 feet, adjacent to Jerome, on August 28, beetle larvæ were found to be present. Adults were secured from mines very soon thereafter. The mines were quite numerous and relatively large. They were not noted elsewhere.

Ocotoma marginicollis Horn. Noted every summer since 1920, and abundant in a few restricted localities along Oak Creek, east of Jerome, in *Perezia thurberi* Gray. Leaves of the food plant are often completely mined out by several larvæ whose mines have become confluent. The plant is very leafy, and the damage is readily observed from a short distance. The adults feed upon the leaves of the same plant, and many may be found on one specimen.

Stenopodius flavidus Horn. Found in September of 1923 and 1924, among the limestone hills east of the Verde River, and

near Jerome. The larvæ produce very small mines in the leaves of *Sphæralcea grossulariæfolia* Rydb., which are inconspicuous and difficult to find because of the light color and dense pubescence of the food plant. The adults feed upon the same species. Both mines and adults are infrequent, generally but one to a plant, with many adjacent plants unaffected. Dr. F. E. Blaisdell reports this species mining the leaves of a bush mallow (*Malvastrum*) near San Diego, California.

The identity of the species here considered has been confirmed by Dr. E. C. Van Dyke.

OBSERVATIONS CONCERNING CERTAIN COLEOPTERA FROM THE YOSEMITE VALLEY,
CALIFORNIA, DURING THE SUMMER
OF 1921

BY E. C. VAN DYKE

Saxinus saucia Lec. Numerous larvæ of this species, many of which were reared to maturity, were found under rocks in the nests of a small brown ant. They were case-bearing like *Coscinoptera dominicana* Fab., a somewhat related insect which has also been found in ants' nests (see Riley, Amer. Naturalist, vol. 16 (1882), p. 598, or Blatchley, Col. of Indiana, p. 1113). This thus means that two of the tribes of our Clytrinae, the Megalostomini and the Bariini, have members which are myrmecophilous during at least part of the larval stage. The members of a related subfamily Chlamydinae have case-bearing larvæ also, but, so far as known, are restricted to vegetation.

Hybodera tuberculata Lec. and *Hybodera debilis* Lec. were both found in numbers on the talus slopes, on the dead branches broken off the preceding winter by an avalanche. The first species was absolutely restricted to the branches of the broad-leaved maple, *Acer machophyllum* Pursh., as was the case with specimens collected in May, 1907, at Port Angeles, Washington; and *debilis* Lec., to various species of oak, chiefly the black oak, *Quercus kelloggii* Newb., and the golden-leaved or maul oak, *Quercus chrysolepis* Liebm., even when the trees were only a few feet apart. This biological habit, together with the fact that the species differ greatly in size, as well as in color and color pattern, should set at rest any doubt as to their specific distinction.

Phymatodes vulnerata Lec. was also found on the dead maple branches, thus confirming the observations of Burke and others.

Dichelonyx oregona Van Dyke, a species described by me from material collected by Mr. F. W. Nunenmacher in Southwestern Oregon, was also found in abundance concealed in the foliage of the golden-leaved oak, *Quercus chrysolepis* Liebm. The yellow color of the beetle harmonized fully with the yellow down on the underside of the leaves. This may also be a case of discontinuous distribution, though I doubt it. We have, however, a very beautiful case of this in *Dichelonyx robusta* Fall, a species described by Fall from material collected in the Willamette Valley, Oregon, and later found east of the Cascades near Klamath Falls, Oregon. During the summer of 1920, Professor E. O. Essig and some of his students found an isolated colony of this on Mt. Hamilton, Santa Clara County, California. No specimens have ever been taken in the intermediate region, even though competent collectors have worked in this territory for years.

OBSERVATIONS ON THE EGG-LAYING
HABITS OF *SAXINIS SAUCIA* LEC.
(COLEOPTERA-CHRYSOMELIDÆ)

BY F. J. SPRUYT

University of California, Berkeley, California

During the summer of 1923, while on the grounds of Stanford University, I made some notes concerning the egg-laying habits of *Saxinis saucia* Lec. which I thought might be of interest as supplementing the observations of Dr. Van Dyke, noted elsewhere in this number.

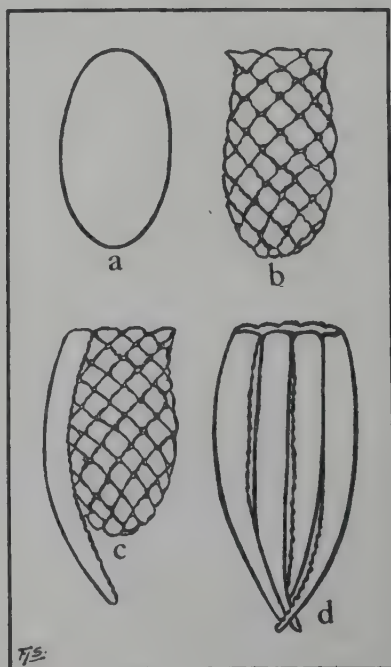
On July 10, 1923, a female of this leaf beetle was observed situated about five feet above the ground on a defoliated twig of a Christmas berry (*Heteromeles salicifolia*). Her abdomen was freely extended from this perch, while a delicate yellow egg (Fig. a) was observed at the apex. Supporting herself with the first two pairs of legs, she had her hind legs available, to use as a set of most adequate molding tools. Holding the egg with the tarsi in a longitudinal position, pressed against the abdomen, small dabs of colleterial material were excreted. After

each discharge, the hind feet slowly moved the egg around from left to right, thus coating it with a solid layer of brownish wax. After this process had continued for twenty minutes, the egg had become materially larger and of a darker color, although it had kept its original shape. The next step in this complicated manner of taking care of the egg, after oviposition, was then taken. It was turned at a right angle with the abdomen, and a circle of wax was placed on the anterior end. Molding it with abdomen and feet a collar was formed, thus giving the egg the shape of a vase. (Fig. b). After a little rest, during which the egg was kept in the same position, a long structure was protruded with little jerks and contractions of the abdomen. It appeared to be slightly serrated and superficially resembled an ovipositor. It was moved along the egg surface (Fig. c), being approximately of the same curvature, was lifted up and protruded again. When this structure extended a little beyond the posterior end of the egg, it was broken off and glued against the still pliable waxy rim. After a few moments the egg was carefully turned and a second band was longitudinally placed and glued, taking about two minutes' time. In all, eight bands were placed. While still wondering what the next move of this solemn artist would be, the elaborate structure was suddenly dropped, before I could realize what had happened, or could even attempt to save it. However, the adult was taken into the laboratory, and that same evening at 10:05 a second egg was produced and treated in similar fashion while being observed by Professor G. F. Ferris and myself. The forming of the bands or ribs took only a little more than a minute, while the whole structure was finished in 30 minutes. The protective ribs were irregular in length and only fastened at the rim, while the hind tarsi continually pressed them against the coated surface of the egg. After the egg was finished and ready to be dropped, it had the appearance of a little seed or shrivelled brown flower bud (Fig. d). The next morning (July 11, 1923) three more eggs had been laid, giving five eggs in approximately fifteen hours. Between oviposition, a rest of about two and one-half hours was observed, during which time the insect very likely feeds and prepares itself for the production of the next egg. Before noon another egg had been laid, but no coating had taken place. However, a few scattered dabs of waxy excretion were found in the container. Her confinement and lack of food were very likely the reason for this.

Several adult females were later observed, the incubation period of whose eggs proved to be twenty-six days. In the flat saucer-like anterior end of the egg, the larva made an incision three-fourths of the circumference of a circle forming a lid which was pushed off. Sometimes one of the ribs came off attached to the lid.

At the time of making these notes it was observed that the young larvæ remained in the egg-shell, and it was presumed that this was either due to the smooth surface of the container which made it difficult for the young larvæ to extricate itself from the egg-shell, or because it served as a temporary protection for the soft body. All of the larvæ observed had this "case-bearing" habit, not understood at the time, but explained by the observations of Dr. E. C. Van Dyke as a result of its later myrmacophilous life. As expressed in my original notes, the newly hatched larvæ remind one of immature caddis flies.

Dr. Van Dyke states that the cases of the adult larvæ were composed of an earthy-looking material, no doubt the excreta, and that they were pistol-shaped. The cases were, therefore, no doubt enlarged by the growing larvæ much in the same manner as a snail enlarges its shell.



SOME BEES COLLECTED BY MR. P. H. TIMBERLAKE
AT RIVERSIDE, CALIFORNIA

BY T. D. A. COCKERELL *

University of Colorado, Boulder, Colorado

NOMIA NEVADENSIS Cresson

Very common at flowers of *Gutierrezia sarothræ* in August. The males are black, the females mostly black, but the abdomen varies to almost entirely red. The last-mentioned specimens are *N. nevadensis* Cresson, which normally has a red abdomen in both sexes. The black specimens are *N. arizonensis angelesia* Cockerell. Typical *N. arizonensis* is not so near to *N. nevadensis*, but I think we must write *N. nevadensis angelesia* and *N. nevadensis arizonensis*. The Californian form *angelesia*, which is normally black, is a separable race, but Mr. Timberlake's specimens show that it intergrades completely with *nevadensis*. I have a male of *N. nevadensis* from Albuquerque, New Mexico, with the abdomen almost entirely black beyond the second segment.

PERDITA MINIMA Cockerell

At flowers of *Euphorbia albomarginata*, August 29 to September 2. Described from specimens collected on *Euphorbia* in Arizona; new to California. The abdomen, in the Riverside specimens, is colored like the head and thorax. Mr. Timberlake notes: "The male has the third discoidal cell obsolescent, and the clypeus is produced into a long prong on each side."

Spinoliella euphorbiæ Cockerell, new species

Female. Length about 6 mm.; black with light yellow markings, those on the face cream-color, on abdomen light lemon-yellow; hair of head and thorax abundant, tinted with ochreous above, white beneath; face below antennæ all pale except the usual clypeal spots and a little space at lower end of dog-ear marks; lower edge of clypeus reddened; a small yellow spot above each eye, sometimes lacking; labrum and base of mandibles cream-color; flagellum short, pale clay-yellow beneath except at base; eyes (in dried specimen) dark greenish or reddish; disc of mesothorax shining and well punctured; upper margin of prothorax with an interrupted pale yellow band, tubercles with or without a pale spot; tegulæ dark rufous; wings hyaline,

* The following correction should be made on page 61 of this journal in the description of *Andrena microdonta*. Line 2 of description should read, "head and thorax black," etc.; and in line 4 from bottom of description, "hind tarsi long, dark brown; abdomen dark green, polished," etc.

stigma small, very pale reddish; abdomen with five broad yellow bands, notched sublaterally behind, the band on first segment narrowed in middle, that on second broadly interrupted, that on fifth with a median black band crossing it; anterior tibiæ on outer side, middle tibiæ basally and a stripe beyond, pale yellow; tarsi light reddish.

Riverside, California, August 29, 1924, females at flowers of *Euphorbia albomarginata*. Mr. Timberlake had determined the species as apparently new; it is nearest to *S. hesperia* Swenk and Cockerell, but smaller, with paler markings, which differ in details.

SOME PARASITIC BEES OF THE PACIFIC COAST REGION

BY T. D. A. COCKERELL

University of Colorado, Boulder, Colorado

DIOXYS PACIFICUS Cockerell

Atascadero, San Luis Obispo County, California, April 26, 1919 (E. P. Van Duzee).

DIOXYS AURIFUSCUS (Titus)

Warner Lake, Lake County, Oregon, high tableland, June 21, 1922 (Van Dyke). New to Oregon.

BOMBOMELECTA EDWARDSII (Cresson)

Male: San Francisco, California, May (Blaisdell); female: San Francisco, California (J. A. Kusche). The female has the hair of pleura all black; it is evidently *B. zygos*. Viereck, which Viereck suggested might be the female of *B. edwardsii*.

NOMADA SIMPLICICOXA Swenk

La Paz, Lower California, June 29, 1919, 3 ♀, 2 ♂ (G. F. Ferris). The females differ from the type in having two small obscure pale spots, or even a band, on lower part of clypeus. The males have the pale marks on under side of abdomen much reduced. The species was described from Tucson, Arizona, and has not been known from any other locality.

Nomada peninsularis Cockerell, new species

Female (type). Length about 7.5-9 mm.; black with pale yellow markings as follows: Base of mandibles broadly, broad lateral face-marks (beginning at level of upper part of clypeus and ending ob-

liquely above level of antennæ), small stripe behind top of eyes, scape in front, swollen upper border of prothorax, tubercles, tegulæ, broad transverse band on mesopleura, two large spots on scutellum, rather short band on postscutellum, very large quadrate patches on metathorax, spots on middle coxæ, large band on hind coxæ, stripe on trochanters in front, spot at apex of femora, anterior tibiæ in front (except a red spot at middle and one at apex), both ends of hind tibiæ above, connected by a stripe below; stripe on basitarsi in front, bands on first four abdominal segments (very broad at sides, tapering and narrowly interrupted medially), a pair of large spots on fifth segment and a pair of peculiar marks (shaped like a crawling snail) on third segment beneath. Head broad; labrum dark, with short white tomentum; clypeus with a faint reddish stain above; antennæ short, third joint longer than fourth; flagellum dull ferruginous, blackened above; third joint with a yellowish spot on outer side; front rough, with a yellow spot before middle ocellus; mesothorax strongly and very densely punctured; scutellum bigibbous; mesopleura strongly punctured; wings dusky, the marginal cell and broad apex dilute fuliginous; stigma ferruginous, nervures piceous; second cubital cell very large and broad; receiving recurrent nervure obliquely beyond middle; basal nervure meeting nervulus; legs mainly black and yellow; anterior tarsi and last joint of other tarsi red; spurs very pale reddish; anterior coxæ well spined; abdomen shining, finely and distinctly punctured.

Male. Length about 6-7 mm.; labrum pale red, with upper margin broadly yellow; face below level of antennæ all light yellow; the lateral face-marks extending obliquely above; scape short; flagellum pale beneath; femora pale yellow in front, the anterior femora also beneath except at base, and the middle ones with the apical half yellow beneath; abdomen with five interrupted bands and spots on sixth segment; venter with broad interrupted bands on third and fourth segments; apical plate notched.

Type, female, No. 1644, Mus. Calif. Acad. Sci., collected by G. F. Ferris, June 29, 1919, at **La Paz, Lower California**. *Paratypes*, two females, four males, same data.

A species of the subgenus *Micronomada*; the female runs in my key to *N. formula* Viereck, a Californian species with much brighter yellow markings. The male runs to *N. modesta* Cresson, but the legs are differently colored and there are many other differences of detail. The species is, however, clearly a derivative of the North American group of *N. modesta*.

THREE NEW FORMS OF COLEOPTERA

BY W. KNAUS

*McPherson, Kansas****Cicindela longilabris chamberlaini* Knaus, new form**

Size, sculpture and form of *montana*. Black, shining, under surface purplish in both sexes.

The only elytral markings are a slender middle band of white, perpendicular to, but never attaining the outer elytral margin; the band slightly angulated toward the apex at upper third, but lacking at least one-fourth of elytral width of attaining the suture; middle band almost entirely lacking in some females.

Fourteen specimens studied, seven males and seven females. Thirteen were received from W. J. Chamberlain, head of Division of Forest Entomology of the State Agricultural College at Corvallis, Oregon, collected by Mr. Chamberlain in the Stein Mountains in Harney County, Southeast Oregon, June 20-25, 1922. With these specimens I have associated a female collected in Provo Cañon, Provo County, Utah, by Tom Spalding. The specimens show little variation in sculpture and markings.

The type, a male, in the author's collection; paratypes are in Mr. Chamberlain's collection, and in the collection of the author.

This easily recognized form is named in honor of the collector. It is much more shining than typical *montana*, a series of which I have from Wyoming, Utah, Montana, and British Columbia, and no doubt represents a race frequenting higher altitudes than does *montana*.

***Strategus antæus houstonensis* Knaus, new form**

Form broader, more depressed and, therefore, less convex than *antæus*. Color castaneous above and on ventral surface. No appreciable difference in the color of the male and female.

Head similar to the head of *antæus*, Clypeus rugose with raised transverse ridge, near center with small tubercle. Thorax of male with short curved apical horn with blunt tip: Posterior thoracic horns short and pointed, the lateral cavities rugose. Length of male thorax 10.5 mm. Width 15 mm., pronotal portion smooth and shining. Scutellum smooth, except a line of coarse punctures at thoracic juncture. Elytra smooth, shining. Elytral length, male, 20 mm., female, 19.5 mm.; width, male, 20 mm., female, 19.5 mm. Total length, male, 30.5 mm., female, 29.5 mm. Thoracic depression of the female deep,

with marked rugosity, the depression extending over one-half the length of thorax.

A depressed line each side of the elytral suture extends one-fourth the length of elytra, and again appears more than a fourth of the distance from the elytral tip. Apices of elytra roughened with shallow punctures. Pygidium uniformly punctured near base, but less so at apex.

Holotype male and allotype female from **Houston, Texas**, have been in my collection for many years.

This form is broader and more depressed than any form of *antæus* I have seen. The form, *semistriatus* of *antæus* was described by Colonel Casey from Texas, but the single male was 33 mm. in length, and 18 mm. in width, being, therefore, longer and more slender than *Strategus* ssp. *houstonensis*.

***Moneilema corpulenta* Knaus, new species**

Large size, black, somewhat shining.

First antennal joint acute externally and internally at apex. Basal joint of hind tarsi more elongate; anterior femora swollen distally. Thorax without lateral tubercles. Head smooth, polished; posterior part with depressed middle line. Antennæ after first joint slender, two-thirds as long as body; fourth and fifth joints annulate with white pubescence; fifth joint with only basal fifth pubescent. Thorax smooth, rounded, with a few scattered punctures near scutellum; ventral line depressed at middle of thorax. Scutellum smooth, impunctate. Elytra widest at middle, narrowing at both base and apex; scattered punctures on front half of elytra, the reflexed flanks also with scattered punctures becoming smoother toward apex. Elytra with narrowing corrugated lines, tending to coalesce toward apex. Legs smooth, shining, as are the abdominal segments.

Length, female, 26 mm., width 14 mm.

One specimen studied received from D. K. Duncan, Globe, Arizona, collected July 7, 1921. This species would come next to *corrugans* Csy. in Leng's Catalogue.

A NEW SPECIES OF DASYTES FROM CALIFORNIA
(MELYRIDÆ: COLEOPTERA)

BY FRANK E. BLAISDELL, SR.

The following fine new species of *Dasytes* is related to *lineellus* Casey:

***Dasytes irregularis* new species**

Form oblong-subovate, widening slightly posteriorly and a little more than twice as long as wide. Color dull black; legs rufous, metafemora sometimes slightly piceous; basal joints of the antennæ more or less pale.

Pubescence closely recumbent, not coarse, rather short, quite dense, but not entirely hiding the body surface, and flavo-plumbeous in color. On the pronotal disk there is a very indefinite mottling with piceous; on the elytra these dark hairs are arranged in very fine longitudinal lines which are more or less obscure and interrupted. Erect hairs entirely absent. On the pronotum the hairs are a little longer and denser. Lateral pronotal fimbriæ short, even, and curved arcuately backward, pale in color; those of the apical and basal margins more dorsally directed. Lateral elytral fringe short and even. Under surface clothed with finer and slightly longer hairs, which are recumbent and moderately dense.

Head relatively moderately large, about two-thirds as wide as the prothorax, about as long as wide, muzzle moderate in length before the antennæ; surface plane, evenly punctate, punctures moderate in size, separated by a distance equal to one and a half to two times their diameter. Eyes rather large, feebly oval and subhemispherically convex, facets moderately small. Antennæ not stout, somewhat slender, extending to about the basal pronotal angles.

Pronotum about a third wider than long, quite as wide as the elytral base, widest posteriorly; apex arcuato-truncate; sides rather strongly rounded, noticeably convergent anteriorly, margin finely serrulate; base broadly and arcuately lobed between the discal lines, thence feebly sinuate and oblique, broadly rounding into the sides, often briefly and slightly notched at position of the basal angles; apical angles less broadly rounded; disk moderately to rather strongly convex from side to side between the submarginal lines, lateral to which the surface is somewhat impressed, especially posteriorly, less than moderately convex antero-posteriorly; disk in the central area distinctly and rather deeply punctate, punctures moderate in size, separated by a distance equal to their diameter. Submarginal line not deep, nearly entire and very evident from the parting of the pubescence; lateral discal area asperate and reticulately sculptured.

Elytra quite oblong, a little less than twice as long as wide; sides rather straight, slightly divergent posteriorly, becoming rather

broadly arcuate at apex, the apical margin reëntrant at the suture and serrulate; base feebly emarginate, humeri not strongly rounded, noticeably tumid, and defined within by a longitudinal impression; disk very feebly convex on dorsum, becoming arcuately and rather abruptly declivous at the sides in basal half, apically quite gradually so; punctures moderately small, not strongly impressed, becoming finer toward apex, where they are rather more widely separated; surface slightly undulate in the basal area.

Epipleura very narrow behind the metacoxæ and rapidly evanescent; moderately broad at base. Abdomen very finely and evenly punctate, a sixth segment visible in both sexes. Legs relatively slender and of moderate length.

Male. Noticeably less broad than female; fifth ventral segment more broadly truncate. Female. Broader; fifth ventral segment feebly arcuate at apex.

Length (types), 2.9-3.1 mm.; width, 1.2-1.4 mm.

Holotype, male, No. 1645, and *allotype*, female, No. 1646, Mus. Calif. Acad. Sci., collected by E. P. Van Duzee, May 20, 1920, at **Bryson, California**. *Paratypes* taken at Bradley, May 17, and at Pleyto, May 21, 1920, all in Monterey County, California.

Irregularis appears to be a very distinct species. In its color, pubescence and the sublineate markings of the elytra, it shows relationship with *lineellus* Casey; it is more elongate, evidently slightly more robust, and is distinctly a larger species. It cannot be confused with any other, and should follow *lineellus* Casey in our lists.

LUCERIA TRANQUILLA GROTE

There seems to have been some uncertainty regarding the relationship existing between the green and brown forms of this pretty noctuid. A few years ago Mr. B. G. Thompson, then of Sacramento, California, sent me a number of full-fed larvæ of this species taken from an elderberry bush in his yard. From these larvæ I obtained sixteen adult moths in perfect condition. Of these, two or three were of a clear green, as many of a rich brown, the others were intermediate, showing all gradations between the two extremes. This shows that the variation of color in this species does not result from fading or chemical action, nor is it a case of dichromatism, but purely one of individual variation.—E. P. Van Duzee.

A NEW SPECIES OF PÆCILONOTA FROM
CALIFORNIA COLEOPTERA FAMILY
BUPRESTIDÆ

BY W. J. CHAMBERLIN

Forest Entomologist, Oregon Agricultural College

Pæcilonota salixi Chamberlin, n. sp.

Form and appearance remarkably like *Dicerca horni*; antenna bronze; vertex with broad, smooth, elevated line, branching out on the front into irregular prominent, black, raised areas; clypeus bronze, smooth at center, coarsely punctate at sides, the incision shallow, broad, angulated. Dorsal surface uniformly, rather densely punctate, each puncture filled with a white powdery substance, dull bronze in color, ventral surface bronze with greenish tinge about the edges. Pronotum with a broad, elevated, black, shining, smooth area bisecting it. This area is very faintly impressed along the middle. Striations of elytra fairly distinct on basal half, but quite indistinct on apical half. A number of small quadrate elevated areas are quite noticeable, on the outer half of each elytrion these are more or less arranged in three lines. This feature further emphasizes the resemblance of this species to *D. horni*. Ventral surface of thorax sparsely clothed with long, fine, white hairs, more dense on prosternum of the male; female much less hairy. Abdomen densely punctate at sides, less so towards center, punctures large and filled with a white powdery substance. Last ventral segment with an emargination quite similar to that of *montanus*, but not so large and more rounded at the corners, with emargination much narrower and V-shaped with bottom of V slightly rounded.

Length, male, 17 mm.; width, 6 mm. Length, female, 19 mm.; width, 7.3 mm.

Described from six specimens, five of which were bred from willow taken at Warners, San Diego County, California, June, 1924, by Mr. Worwick Bennedict, to whom I am indebted for the privilege of describing the species and for the type ♂ and ♀ now in my collection. One other specimen was sent me for comparison by Dr. Van Dyke. I have labeled this a paratype, but with some hesitancy. It is a very large female 22.5 mm. long and 8.6 mm. wide, taken in Arroyo Seco Canyon, Los Angeles. It is much darker, apices of elytra only faintly emarginate; striations much more prominent than in the typical forms.

The species is quite unlike any of our other forms, and, as

stated above, bears a striking resemblance to *Dicerca horni*. It is quite probable that specimens are now in collections under the latter name. It can be separated at once by the broad scutellum.

PÆCILONOTA FRASERI Chamberlin

This species, heretofore known only by the type material from Canada, has turned up in California, Dr. Van Dyke having secured specimens at Fallen Leaf Lake and Lake Tahoe in 1915, and Meadow Valley, Plumas County, California, in 1924.

PÆCILONOTA MONTANUS Chamberlin

Several females of this species were taken ovipositing in black cottonwood at Oakridge, Oregon, June 24, 1924, and one male has just been received from Cascade, Idaho.

ECONOMIC NOTES

BY E. O. ESSIG

*University of California, Berkeley, California*PROSPALTELLA AS AN EGG PARASITE OF THE CODLING
MOTH

This last summer the Pest Control Department of the Saticoy Walnut Growers' Association in Ventura County had four men in the field, devoting all their time to codling-moth observations. A weekly census of the codling moth on permanent "check" trees scattered throughout three thousand acres of walnut orchards is made each year in order to follow the dispersal from the center of infestation, to obtain a record of the yearly fluctuation in abundance, and to check up the efficacy of control measures.

Mr. Dean Burk was detailed to make a daily observation of the eggs deposited on six trees at the center of infestation, recording the incubation period of each egg and the appearance of the embryo each day. At the end of the season his record shows that, of 1297 eggs found on the nuts, 665 were followed from the time of deposition to the time of hatching. This period averaged twelve and one-half days.

In studying the appearance of the embryo with the aid of a hand lens, he found that he was able to ascertain those that were parasitized even before the egg shell turned black (an indication that the parasite was in the pupal stage). In each egg the parasitic larva was faintly visible, sometimes moving nematode-fashion. When nearly mature, its brown, opaque alimentary tract is easily seen.

The nuts carrying the infested eggs were brought into the laboratory for closer observation. As the shell of each egg turned black, it was removed from the nut and placed in a petri dish. The newly formed pupa is light yellow and lies within the egg shell, surrounded by masses of brown excreta.

After two to three weeks in the pupal stage, the adults emerged (one from each egg). With a fine needle I removed several of the pupæ from the eggs and observed their transformation. On two occasions I assisted the emerging adults in removing portions of the pupal integument from the antennæ and legs.

The parasitized eggs were found on the following dates:

May 30, 3 eggs, by *Trichogramma*.

May 31, 1 egg, by *Prospaltella*.

June 2, 1 egg, by *Prospaltella*.

June 16, 1 egg, by *Prospaltella*.

June 18, 1 egg, by *Prospaltella*.

June 23, 2 eggs, by *Prospaltella*.

June 24, 1 egg, by *Prospaltella*.

July 5, 1 egg, by *Prospaltella*.

July 7, 9 eggs, by *Prospaltella*.

July 8, 15 eggs, by *Prospaltella*.

July 9, 3 eggs, by *Prospaltella*.

July 14, 1 egg, by *Prospaltella*.

July 19, 1 egg, by *Prospaltella*.

July 25, 1 egg, by *Prospaltella*.

One egg, recorded as parasitized, recovered and hatched after a period of twenty-six days.

I have never found an Aleyrodid or Diaspine scale (the usual hosts for *Prospaltella*) on the nut itself, but have observed *Aspidiotus juglans-regiæ* on leaf petiole and current season's growth.

In rearing out these parasites, there was no possibility of other host relation.—S. E. Flanders, Saticoy, California.

AMPHIPOD IN CITY WATER SYSTEM

On April 5, 1924, the writer received a single specimen of an amphipod reported to be quite numerous in the water system of the city of San Francisco. The same was forwarded to the United States National Museum, and the following interesting reply received from W. deC. Ravenel under date of August 31, 1924:

"The specimen which you forwarded on April 7 has been examined by Mr. Clarence R. Shoemaker, Assistant Curator of Marine Invertebrates, who furnishes the following information:

"The amphipod taken from the water system of the city of San Francisco is *Corophium spinicorne* Stimpson. This amphipod was described from San Francisco Bay by William Stimpson in 1857, where it appears to be quite common, inhabiting the muddy bottoms of shallow water, and also the surfaces of old piles of wharves. In the mud it lives in small tubular galleries, which are probably made by the annelid worms upon which it feeds. The eggs are carried in a pouch on the under

side of the body until they hatch, and even after hatching the young remain in this pouch for some time. Although the genus *Corophium* is commonly confined to salt water, it has occasionally been reported from fresh, and has been recorded several times from the fresh waters near Berlin, Germany, and from Norfolk, England, in water that was almost fresh, but the present is the first record of its occurrence in the fresh waters of America.

The animal has no deleterious effect upon the water, and would be quite harmless if drunk by accident, but any such specimens would be removed by filtration or straining through cheese-cloth.

Other genera of amphipods and isopods frequently occur in the waters of surface wells, springs, and artesian wells, and indeed such waters are their natural habitat as certain species never occur anywhere else. These fresh-water species, however, never occur in any great numbers, and all, so far as I have been able to determine, are harmless.

There is no record of the life history of *Corophium spinicorne*, but a description of the animal by J. Chester Bradley may be found in the University of California Publications in Zoology, Vol. 4, No. 4, p. 230, May 15, 1908.'"—E. O. Essig.

THE PINE NEEDLE MITE

The work of the pine needle mite, *Eriophyes pini* Nalepa, is again becoming conspicuous in Golden Gate Park. The pines affected are mostly *Pinus radiata* Don., the Monterey Pine. The trees in question present a rather sickly appearance, their needles having turned brown and mostly fallen off. The mites spend their whole life within the tight-fitting basal sheath of the needle clusters, except when migrating to the young needles in the spring. While the exact method of dispersal is uncertain, the wide distribution of the pest in the park shows that it does spread, even if slowly. In view of the apparent lack of effective natural enemies and the inaccessibility of the mites to sprays, they may well become a serious pest in time. At present the only method of control promising to be effective would seem to be the destruction of the affected trees. Further observations on the subject are needed and communications are invited.—Eric Walther, Golden Gate Park, San Francisco.

THE PAN-PACIFIC ENTOMOLOGIST

Published quarterly by the Pacific Coast Entomological Society
in co-operation with the California Academy of Sciences

E. P. VAN DUZEE, Editor F. E. BLAISDELL, M. D., Treasurer

The death of Mr. Albert Koebele, which occurred at Waldkirch, Germany, December 28, 1924, removes one of the landmarks of American entomology, and one who was closely connected with the development of economic entomology in the West. For many years he had his home at Alameda, California, but he had previously lived for a time at Easton, Washington, and had spent considerable periods of time, in the search for predacious and parasitic insects, at Nogales, Arizona, and other places nearer the coast in California and Oregon. Mr. Koebele was, perhaps, best known for his work on the introduction of the coccinellids predacious upon the cottony cushion scale and other scale insects, and the introduction into the Hawaiian Islands of an efficient parasite of the sugar-cane leafhopper. We hope to be able to publish a short sketch of his entomological activities in the next issue of this journal.

An expedition to the Revillagigedo Islands, off the southern end of Lower California, under the auspices of the California Academy of Sciences, sailed on April 15 on the U. S. S. minesweeper *Ortolan*. The plans for the expedition include a stop at Guadalupe and Cedros Islands, and before returning a visit to the Tres Marias Islands off San Blas, Mexico. The department of entomology is represented by Mr. Hartford Keifer, now assistant curator in that department of the California Academy of Sciences. The results of this expedition should prove of much scientific value.

Two books on our North American insects have recently reached the California Academy of Sciences that call for special notice. Comstock's *Introduction to Entomology* (Comstock Publishing Co., Ithaca, N. Y.) is more than a mere introduction to the science of entomology. It is really a handbook, and at once takes its place as the most useful general treatise on our North American insects now obtainable. The portions devoted to Lepidoptera, and the phytophagous Hemiptera are perhaps the most complete, but all the orders are

treated as fully as the size of the volume (1044 pages) would allow. The other work referred to is on the Lepidoptera of New York and neighboring States, and is by William T. M. Forbes (Cornell University Agricultural Experiment Station, Memoir 68). This is a volume of 728 pages and covers the "primitive forms, Microlepidoptera, Pyraloides and Bombyces," and in a general way accounts for about one-half of the order, leaving the diurnals, Sphingidæ, Noctuidæ, Geometridæ, and other related families for a future volume. Keys are given to all families, genera and species, with a short diagnostic description of each. It is truly a monumental work and one that will prove absolutely indispensable to every real student of this most attractive order of insects. This is the first time such a work has been attempted for any considerable portion of our Lepidoptera, and it is greatly to be hoped that the second volume can be gotten out without undue delay. The present volume will take its place on our shelves alongside such works as Professor Blatchley's on the Coleoptera and Orthoptera of Indiana, the Hemiptera and Hymenoptera of Connecticut, and Morse's Orthoptera of New England, works which, as far as they go, cover the insect faunas of the eastern portion of our country in a fairly complete way.

The present number completes the first volume of the *Pan-Pacific Entomologist*. It has been the aim of the editorial committee to include material of value to students of the several phases of insect life, and we feel that, in a degree, this has been accomplished. It will be our aim to make Volume Two of still greater value. We wish to extend our sincere thanks to our contributors and to the subscribers, whose support has made possible the continuation of the journal, and trust that each one will send in his renewal promptly, and, if possible, with it the name of a new subscriber. The journal is not yet self-sustaining, but, with the loyal support of our old subscribers and the new ones to come, we hope it soon will be. The date of mailing the numbers has been: No. 1, June 25, 1924; No. 2, October 25, 1924; No. 3, February 14, 1925; No. 4, May 22, 1925.

INDEX TO LATIN NAMES

- Ablautus **squamipes** Cole, 11.
 Adelges Vall, 79.
 tsugæ Ann, 79.
 Akotropis Mats., 159.
 Allosphærocera Hend., 67.
 Amblycratus Uhl., 161.
 Andrena, 57.
 p. arizonensis V. & C., 57.
 s. aurescens Ckll., 64.
 blaisdelli Ckll., 59.
 candida Sm., 58.
 carissima Ckll., 58.
 cerasifolii Ckll., 58.
 epileuca Ckll., 62.
 m. falli Ckll., 57.
 lustrans Ckll., 63.
 mesoleuca Ckll., 60.
 microdonta Ckll., 61, 179.
 mimetica Ckll., 57.
 nigrocærulea Ckll., 57.
 prunorum Ckll., 57.
 semicyanea Ckll., 58.
 subtristis Ckll., 57.
 supervirens Ckll., 64.
 surda Ckll., 60.
 yosemitensis Ckll., 61.
 Anisostena **californica** Van D., 170.
 Anorus piceus Lec., 187.
 Anthophora anstrutheri Ckll., 53.
 aterrima Ckll., 51.
 curta Prov., 52.
 flexipes Cress., 53.
 ignava Cress., 51.
 nigritula Ckll., 52.
 pacifica Cress., 51.
 sodalis Cress., 51.
 stanfordiana Ckll., 52.
 texana Cress., 50.
 urbana Cress., 52.
 washingtoni Ckll., 51.
 Apantesis approximata Stretch, 132.
 incarnata Stretch, 134.
 intermedia Stretch, 132.
 obliterata Stretch, 132.
 phalerata Harr., 133.
 pulcherrima Stretch, 134.
 Aphalara **martini** Van D., 22, 25.
 Aphodius **finetarius** Linn., 78.
 Apocheiridium Chamb., 34.
 ferum Simon, 37.
 ferumoides Chamb., 35.
 mormon Chamb., 36.
 Aptilotus Mik, 69.
 politus Will., 70.
 borealis Mall., 70.
 Asilidæ, 7.
 Asyndetus **spinosus** Van D., 153.
 Aulocorypha Berg., 159.
 Baliosis californicus Horn, 174.
 Betacixius Mats., 159.
 Bodecia Walk., 159.
 Bombomelecta **edwardsii** Cress., 180.
 Brachycoryna **dolorosa** Van D., 171.
 hardyi Crotch, 171.
 horni Weise, 171.
 melsheimeri Horn, 171.
 Calerda Sign., 160.
 Calosoma subæneum Chaud., 82.
 Carabinæ, 111.
 Carabus nemoralis Mull., 78.
 Centrioptera **elongata** Csy., 87.
 texana Blaisd., 88.
 Centris **a. ferrisi** Ckll., 49.
 trichosoma Ckll., 49.
 Chalepus ater Weise, 174.
 Cheiridium Menge, 37.
 museorum Leach, 38.
 Chroneba Dist., 161.
 Cicindela **l. chamberlaini** Knaus, 182.
 Cionoderus Uhl., 161.
 Cisthene plumbea Stretch, 128.
 Cixiidæ, 97, 156.
 Clisodon **syringæ** Ckll., 50.
 Clivina **californica** Van D., 124.
 sulcipennis Perty, 125.
 Clusivius Dist., 161.
 Cœlioxys **angulifera** Ckll., 148.
 apacheorum Ckll., 147.
 asclepiadis Ckll., 149.
 r. claripes Ckll., 146.
 coquelletti Crawl., 145.
 deani Ckll., 147.

- Cælixys deplanata* Cress., 148.
fragariæ Ckll., 148.
gilensis Ckll., 147.
hypodonta Ckll., 150.
r. kincaidi Ckll., 148.
mediata Ckll., 146.
megatracha Ckll., 148.
menthæ Ckll., 145.
moesta Cress., 148.
novomexicana Ckll., 145.
quercina Ckll., 148.
r. rhois Ckll., 146.
ribis Ckll., 148.
rufitarsis Sm., 146.
salinaria Ckll., 148.
texana Cress., 145.
wisconsinensis Ckll., 145.
Coloradia pandora Blake, 143.
Colvanalia Muir, 162.
Coniontis inconspicua Csy., 84.
lamentabilis Blaisd., 85.
n. sleveni Blaisd., 86.
g. ventura Blaisd., 83.
Cophura pulchella Will., 9.
trunca Coq., 9.
Cordylura luteola Mall., 14.
Corophium spinicorne Stimp., 189.
Crocota belfragei Stretch, 128.
Cryptorhynchus lapathi Linn., 78.
Cyrini, 1.
Cyphoceratops Uhl., 160.
Cyrtopogon callipedilus Loew, 10.
nitidus Cole, 10.
perspicax Cole, 10.
tacomæ Mel., 10.
willistoni Curran, 10.
Dasiapis ochracea Ckll., 53.
Dasytes irregularis Blaisd., 184.
Diadasia bituberculata Cress., 54.
blaisdelli Ckll., 54.
crassicauda Ckll., 54.
a. mimetica Ckll., 53.
nigrifrons Cress., 53.
Dicolonus sparsipilosum Back, 9.
Dichelonyx oregona Van D., 176.
robusta Fall, 176.
Dioctria doanei Mel., 9.
nitida Will., 9.
s. rivalis Mel., 9.
rubida Coq., 9.
vertebrata Cole, 9.
Dioxys aurifuscus Titus, 180.
pacificus Ckll., 180.
Dolichopodidæ, 43, 73, 153.
Dolichovespula diabolica Saus., 40.
Ecpantheria semiclara Stretch, 168.
suffusca Schs., 169.
Elaphrus caseyi Leng., 113.
lævigatus Lec., 113.
parviceps Van D., 112.
politus Csy., 113.
Emphoropsis depressa Fwlr., 49, 155.
interspersa Ckll., 50.
murina Ckll., 49.
Epicnaptera alascensis Pack., 164, 167.
americana Harr., 164.
californica Pack., 164.
carpinifolia Bdv., 164, 165.
dyari Rivers, 164, 167.
ferruginea Pack., 164, 165.
mildei Stretch, 164, 166.
Eriophyes pini Nalepa, 190.
pyri Pagen, 45.
Eubaphe a. brevicornis Walk., 128.
costata Stretch, 129.
flava B. & B., 131.
obscura Stretch, 129.
opella, forms of, 130.
Eucarpia Walk., 160.
Euchætias elegans Stretch, 135.
oregonensis Stretch, 136.
Eudelphax Mel., 160.
Eurytrachelus p. typhoniformis Nagel, 72.
Eutricholistra Blaisd., 17.
punctata Blaisd., 17.
Galerucella xanthomelaena Schr., 93.
Grotellaforma lactea Stretch, 136.

- Halisidota a. sobrina* Stretch, 128.
Hamba Dist., 161.
Harrisina australis Stretch, 138.
metallica Stretch, 138.
Herculia phœzalis Dyar, 93.
Hesperochnes Chamb., 89.
lauræ Chamb., 90.
Hispinæ, 170, 174.
Holopogon atrifrons Cole, 8.
Hybodera debilis Lec., 175.
tuberculata Lec., 175.
Hydrophorus fumipennis Van D., 155.
Ipsnola Sign., 160.
Kinnaridæ, 98, 110, 158.
Kinnara albiplaga Dist., 159.
Kuwayama lavateræ Van D., 22, 24.
Lasiopogon actius Mel., 7.
aldrichi Mel., 7.
arenicola O. S., 8.
fumipennis Mel., 7.
littoris Cole, 8.
monticola Mel., 8.
Leucopis atrifacies Aldr., 152.
Listrus anacapensis Blaisd., 20.
foxi Blaisd., 19.
minutus Blaisd., 18.
Loricera key to, 114.
californica Lec., 113.
semipunctata Esch., 113.
p. sierræ Van D., 113.
Luceria tranquilla Grt., 185.
Macrocixius Mats., 160.
Meenoplidæ, 97, 158.
Megophthalma americana Mall., 14.
Melamomphus sordidus Horn, 45.
Melipotis indomita Walk., 94.
Melissodes calloleuca Ckll., 55.
lavata Ckll., 56.
metenua Ckll., 56.
Melyridæ partial key, 17.
Mesorhaga clavicauda Van D., 154.
Metopogon setigera Cole, 9.
Metrius key to, 123.
c. planatus Van D., 122.
Microrhopala cyanea Say, 173.
rubrolineata Mann., 173.
r. militaris Van D., 173.
r. vulnerata Horn, 173, 174.
Moneilima corpulenta Knaus, 183.
Monoleuca disconcolorata B. & B., 126.
fieldi B. & B., 126.
Monorachis Uhl., 160.
Myelaphus lobicornis O. S., 10.
Nebria crassicornis Van D., 121.
lyelli Van D., 120.
meanyi Van D., 118.
piperi Van D., 117.
riversi Van D., 115.
schwarzi Van D., 116.
spatulata Van D., 119.
Neoarctia yarrowii Stretch, 131.
Neoclytus carus Fall, 169.
modestus Fall, 169.
Nesomyndus Jac., 160.
Nomada peninsularis Ckll., 180.
simplicicoxa Swenk, 180.
Nomia nevadensis Cress., 179.
Nothocharis Muir, 162.
bakeri Muir, 163.
tayabasensis Muir, 163.
Octotoma marginicollis Horn, 174.
Oliarus Stål, 161.
Olonia Muir, 161.
Onthophilus lecontei Horn, 6.
Paraphrosylus Becker, 73.
direptor Whl., 74.
fumipennis Van D., 76.
nigripennis Van D., 75.
prædator Whl., 74.
tenuipes Van D., 77.
Parasphærocera Spuler, 67.
Parataracticus Cole, 11.
rubidus Cole, 12.
Perdita minima Ckll., 179.
Phymatodes vulnerata Lec., 176.
Plecoma behrensi Lec., 110.

- Poecilonota salixi* Chamb., 186.
fraseri Chamb., 187.
montanus Chamb., 187.
Polistes, 142.
Pristoscelis vandykei Blaisd., 15.
Promecognathus Chd., 123.
Prosops Bcktn., 160.
Prosotropis Uhl., 161.
Prospaltella, 188.
Saxinis saucia Lec., 175, 176.
Scaphinotus angulatus Harr., 6.
behrensi Roesch, 6.
s. bullatus Van D., 3.
catalinæ Van D., 2.
s. grandis Van D., 4.
johnsoni Van D., 3.
longiceps Van D., 5.
a. maritimus Van D., 5.
e. neomexicanus Van D., 1.
Schizogenius pygmæus Van D., 125.
Scutigerella immaculata Newf., 45.
Sphæridium scarabæoides Linn., 78.
Sphærocera Latr., 66.
annulicornis Mall., 68.
bimaculata Will., 68.
pallipes Mall., 68.
pusilla Fall., 69.
scabra Spuler, 68.
subsultans Fabr., 68.
Spinoliella euphoribæ Ckll., 179.
Stenopodius flavidus Horn, 174.
Strategus a. houstonensis Knaus, 182.
Tachytrechus spinitarsis Van D., 43, 96.
Taloka Dist., 161.
Telea polyphemus Cram., 142.
Teralonia atriventris Sm., 55.
lata Prov., 55.
robertsoni Ckll., 55.
Tetrichus, 43, 96.
Theridion berkeleyi Emert., 30.
californicum Bnks., 30.
placens Keys., 29.
punctipes Emert., 29.
stanfordi Emert., 29.
Tiriteana Myers, 161.
Trachypachus key, 112.
slevenii Van D., 111.
Triclis tagax Will., 10.
Tropisternus salsamentus Fall, 169.
Typhlusechus singularis Linl., 65.
Valgus californicus Horn, 65.
Vanessa cardui Linn., 45.
Xenoglossa angelica Ckll., 53.
p. angustior Ckll., 53.

GENERAL INDEX

- Aldrich, J. M., personals, 48.
 Aldrich, J. M., paper by, 152.
 Amphipod in City Water, 189.
 Andrena, paper on, 57.
 Annand, P. N., paper by, 79.
 Anthophorid bees, paper on, 49.
 Asilidæ, paper on, 7.
 Barnes and Benjamin, papers by, 126, 127, 164.
 Bees from Riverside, California, 179.
 Blaisdell, F. E. Sr., notes by, 6, 65, 82, 169.
 Blaisdell, papers by, 15, 83, 87, 184.
 Brisley, note by, 94.
 California Academy of Sciences, Entomology in, 144.
 Carabinæ, studies in, 111.
 Chamberlin, J. C., papers by, 32, 89.
 Chamberlin, J. C., personal, 96.
 Chamberlin, W. J., paper by, 186.
 Cheiridiinæ of North America, 32.
 Chermidæ, papers on, 22, 24.
 Cixiidæ, Genera of, 97, 156.
 Cockerell, T. D. A., papers by, 49, 57, 139, 145, 179, 180.
 Cockerell, T. D. A., personal, 48.
 Codling moth, parasites, 188.

- Cœlioxys in California Academy of Sciences, 145.
- Cole, F. R., paper by, 7.
- Comstock's Introduction to Entomology, 191.
- Cordylurid flies, paper on, 14.
- Cydrini, new species of, 1.
- Cypress Moth, 93.
- Davis, A. C., note by, 169.
- Dolichopodidæ, papers on, 43, 73, 153.
- Duncan, C. D., papers by, 40, 42.
- Duran, Victor, note by, 142.
- Elm-leaf beetle, 93.
- Emerton, J. H., paper by, 29.
- Essig, notes by, 45, 93, 94, 189.
- Fall, H. C., personals, 144.
- Ferris, G. F., paper by, 24.
- Flanders, S. E., note by, 188.
- Flea larvæ in sugar, 94.
- Forbes' Lepidoptera of New York, 192.
- Fox, C. L., personals, 48.
- Giffard, W. M., personals, 48.
- Gulf of California, entomology of, 139.
- Helix, predacious, 142.
- Henderson, W. W., personals, 48.
- Hermes, W. B., personals, 48, 144.
- Hispinæ, papers on, 170, 174.
- Holbrook collection, 96.
- International Congress of Entomology, 144.
- Jones, W. W., and Brisley, H., paper by, 174.
- Keifer, H. H., note by, 143.
- Knaus, W., paper by, 182.
- Koebele, Albert, Necrology, 191.
- Lovette, A. L., Necrology, 48.
- Malloch, J. R., paper by, 14.
- Melyridæ, paper on, 15, 182.
- Muir, F., paper by, 97, 156.
- Muir, F., personal, 47.
- Nagel, Paul, paper by, 72.
- Pacific Coast Entomological Society 95.
- Pear blister mite, 45.
- Pine needle mite, 190.
- Polistes, mating of, 142.
- Prospaltella from Codling Moth, 188.
- Pseudo-scorpions, 32.
- Revillagigedo Islands expedition, 191.
- Rust, E. W., note by, 142.
- Spiders, new Californian, 29.
- Spiracles, sound-producing, 42.
- Spruyt, F. J., paper by, 176.
- Spuler, Anthony, paper by, 66.
- Stretch Collection, types, 127, 164.
- Timberlake, P. H., bees collected by, 179.
- Timberlake, P. H., personals, 92.
- Van Dyke collection of Coleoptera, 13, 96.
- Van Dyke, E. C., notes by, 78, 142, 175.
- Van Dyke, E. C., papers by, 1, 111, 170.
- Van Dyke, E. C., personals, 48.
- Van Duzee, E. P., editorial, 46, 95, 144, 191.
- Van Duzee, E. P., note by, 185.
- Van Duzee, E. P., paper by, 22.
- Van Duzee, E. P., personals, 92.
- Van Duzee, M. C., papers by, 43, 73, 153.
- Walther, Eric, note by, 190.
- Wheat seed, protection of, 93.
- Yosemite Valley, Coleoptera from, 175.

THE PAN-PACIFIC ENTOMOLOGIST

Published by the
Pacific Coast Entomological Society
in co-operation with
The California Academy of Sciences

CONTENTS

VAN DYKE, NEW SPECIES AND SUBSPECIES OF CYCHRINI FROM WESTERN NORTH AMERICA	1
COLE, NOTES ON THE DIPTEROUS FAMILY ASILIDÆ, WITH DESCRIPTIONS OF NEW SPECIES	7
MALLOCH, TWO NEW CORDYLURID FLIES FROM THE PACIFIC COAST	14
BLAISDELL, NEW MELYRID FROM CALIFORNIA, III	15
VAN DUZEE, TWO CHERMIDÆ FROM CALIFORNIA	22
FERRIS, THE NYMPHS OF TWO SPECIES OF CHERMIDÆ	24
EMERTON, NEW CALIFORNIA SPIDERS	29
CHAMBERLIN, THE CHEIRIDIINÆ OF NORTH AMERICA	32
DUNCAN, DOLICHOVESPUA DIABOLICA SAUSS. AND ITS SUPPOSED VARIETY FERNALDI LEWIS	40
DUNCAN, SPIRACLES AS SOUND PRODUCING ORGANS	42
VAN DUZEE, A NEW WESTERN DOLICHOPODID	43
ESSIG, ECONOMIC NOTES	45
EDITORIAL ANNOUNCEMENT	46
PERSONALS	47

San Francisco, California

1924

THE PAN-PACIFIC ENTOMOLOGIST

Published quarterly in July, October, January and April, by the Pacific Coast Entomological Society in co-operation with the California Academy of Sciences.

Annual subscription \$2.00 in advance for the United States and Canada; \$2.25 for foreign countries. Subscriptions should be sent to the treasurer, Dr. F. E. Blaisdell, 1520 Lake Street, San Francisco, California. Make checks payable to the "Pan-Pacific Entomologist."

Manuscripts for publication and communications regarding non-receipt of numbers, change of address, requests for sample copies, etc., should be addressed to the editor, Mr. E. P. Van Duzee, California Academy of Sciences, Golden Gate Park, San Francisco, California. Advertisements will be accepted for the back cover pages. For rates address the editor or treasurer.

Twenty-five copies of author's extras will be furnished free on request. Additional copies will be supplied at cost of publication if a request is received with the manuscript.

THE PAN-PACIFIC ENTOMOLOGIST

Published by the
Pacific Coast Entomological Society
in co-operation with
The California Academy of Sciences

CONTENTS

COCKERELL, ANTHOPHORID BEES	49
COCKERELL, BEES OF THE GENUS ANDRENA	57
SPULER, NORTH AMERICAN SPECIES OF SPHÆROCERA	66
NAGEL, A NEW FORM OF LUCANID	72
VAN DUZEE, M. C., NORTH AMERICAN SPECIES OF PARAPHROSYLUS	73
ANNAND, A NEW SPECIES OF ADELGES	79
BLAISDELL, NEW FORMS OF CONIONTIS	83
BLAISDELL, A NEW CENTRIOPTERA	87
CHAMBERLIN, HESPEROCHERNES LAURÆ	89
PERSONALS	92
ECONOMIC NOTES	93
EDITORIAL COMMENT	95

THE PAN-PACIFIC ENTOMOLOGIST

Published quarterly in July, October, January and April by the Pacific Coast Entomological Society in co-operation with the California Academy of Sciences.

Annual subscription \$2.00 in advance for the United States and Canada; \$2.25 for foreign countries. Subscriptions should be sent to the treasurer, Dr. F. E. Blaisdell, 1520 Lake Street, San Francisco, California. Make checks payable to the "Pan-Pacific Entomologist."

Manuscripts for publication and communications regarding non-receipt of numbers, change of address, requests for sample copies, etc., should be addressed to the editor, Mr. E. P. Van Duzee, California Academy of Sciences, Golden Gate Park, San Francisco, California. Advertisements will be accepted for the back cover pages. For rates address the editor or treasurer.

Twenty-five copies of author's extras will be furnished free on request. Additional copies will be supplied at cost of publication if a request is received with the manuscript.

Subscribers failing to receive their numbers will please notify the editor at as early a date as possible.



PUBLICATION COMMITTEE, PAN-PACIFIC ENTOMOLOGIST

E. O. ESSIG, *Chairman*

G. F. FERRIS

R. A. DOANE

E. C. VAN DYKE

GRANT WALLACE

REGIONAL MEMBERS

W. W. HENDERSON, Logan, Utah

J. C. CHAMBERLIN, Riverside, California

E. P. VAN DUZEE, *Editor*

E. C. VAN DYKE, *Associate Editor*

F. E. BLAISDELL, SR., *Treasurer*

THE PAN-PACIFIC ENTOMOLOGIST

Published by the
Pacific Coast Entomological Society
in co-operation with
The California Academy of Sciences

CONTENTS

MUIR, ON THE GENERA OF CIXIIDÆ, MEENOPLIDÆ AND KINNARIDÆ	97
VAN DYKE, STUDIES OF WESTERN NORTH AMERICAN CARABINÆ	111
BARNES AND BENJAMIN, TWO NEW CALIFORNIAN LIMACODID MOTHS	126
BARNES AND BENJAMIN, NOTES ON SOME SPECIES OF LEPIDOPTERA IN RELATION TO THE STRETCH COLLECTION	127
COCKERELL, THE ENTOMOLOGY OF THE GULF OF CALIFORNIA	139
ESSIG, ECONOMIC NOTES	142
EDITORIAL COMMENT AND PERSONALS	144

THE PAN-PACIFIC ENTOMOLOGIST

Published quarterly in July, October, January and April by the Pacific Coast Entomological Society in co-operation with the California Academy of Sciences.

Annual subscription \$2.00 in advance for the United States and Canada; \$2.25 for foreign countries. Subscriptions should be sent to the treasurer, Dr. F. E. Blaisdell, 1520 Lake Street, San Francisco, California. Make checks payable to the "Pan-Pacific Entomologist."

Manuscripts for publication and communications regarding non-receipt of numbers, change of address, requests for sample copies, etc., should be addressed to the editor, Mr. E. P. Van Duzee, California Academy of Sciences, Golden Gate Park, San Francisco, California. Advertisements will be accepted for the back cover pages. For rates address the editor or treasurer.

Twenty-five copies of author's extras will be furnished free on request. Additional copies will be supplied at cost of publication if a request is received with the manuscript.

Subscribers failing to receive their numbers will please notify the editor at as early a date as possible.



PUBLICATION COMMITTEE, PAN-PACIFIC ENTOMOLOGIST

E. O. ESSIG, *Chairman*

G. F. FERRIS

R. A. DOANE

E. C. VAN DYKE

GRANT WALLACE

REGIONAL MEMBERS

W. W. HENDERSON, Logan, Utah

J. C. CHAMBERLIN, Riverside, California

E. P. VAN DUZEE, *Editor*

E. C. VAN DYKE, *Associate Editor*

F. E. BLAISDELL, SR., *Treasurer*

Published at the California Academy of Sciences, Golden Gate Park, San Francisco, California.

Application for entry as second-class matter is pending.

TP

E & A

IMP. JOUR.
- 8 JUN. 1925
ENTOM.

Vol. I

April, 1925

No. 4

THE PAN-PACIFIC ENTOMOLOGIST

Published by the
Pacific Coast Entomological Society
in co-operation with
The California Academy of Sciences

CONTENTS

+ COCKERELL, BEES OF THE GENUS CœLIOXYs	145
+ ALDRICH, A NEW LEUCOPIS FROM SAN FRANCISCO	152
+ VAN DUZEE, M. C., DOLICHOPODIDS, NEW OR IMPERFECTLY KNOWN	153
+ MUIR, ON THE GENERA OF CIXIIDÆ, MEENOPLIDÆ, AND KINNARIDÆ, II	156
+ BARNES AND BENJAMIN, ADDENDA TO NOTES ON THE STRETCH COLLECTION	164
+ VAN DYKE, NOTES AND DESCRIPTIONS OF WEST AMERICAN HISPINÆ	170
JONES AND BRISLEY, FIELD NOTES CONCERNING ARIZONA HISPINÆ	174
VAN DYKE, OBSERVATIONS ON COLEOPTERA OF YOSEMITE VALLEY	175
+ SPRUYT, EGG-LAYING HABITS OF SAXINIS SAUCIA LEC.	176
+ COCKERELL, BEES COLLECTED BY P. H. TIMBERLAKE	179
+ COCKERELL, SOME PARASITIC BEES FROM PACIFIC COAST	180
+ KNAUS, THREE NEW FORMS OF COLEOPTERA	182
+ BLAISDELL, A NEW SPECIES OF DASITES FROM CALIFORNIA	184
+ CHAMBERLIN, A NEW SPECIES OF POECILONOTA FROM CALIFORNIA	186
ECONOMIC NOTES	188
EDITORIAL COMMENT	191

San Francisco, California
1925

THE PAN-PACIFIC ENTOMOLOGIST

Published quarterly in July, October, January and April by the Pacific Coast Entomological Society in co-operation with the California Academy of Sciences.

Annual subscription \$2.00 in advance for the United States and Canada; \$2.25 for foreign countries. Subscriptions should be sent to the treasurer, Dr. F. E. Blaisdell, 1520 Lake Street, San Francisco, California. Make checks payable to the "Pan-Pacific Entomologist."

Manuscripts for publication and communications regarding non-receipt of numbers, change of address, requests for sample copies, etc., should be addressed to the editor, Mr. E. P. Van Duzee, California Academy of Sciences, Golden Gate Park, San Francisco, California. Advertisements will be accepted for the back cover pages. For rates address the editor or treasurer.

Twenty-five copies of author's extras will be furnished free on request. Additional copies will be supplied at cost of publication if a request is received with the manuscript.

Subscribers failing to receive their numbers will please notify the editor at as early a date as possible.



PUBLICATION COMMITTEE, PAN-PACIFIC ENTOMOLOGIST

E. O. ESSIG, *Chairman*

G. F. FERRIS

R. A. DOANE

E. C. VAN DYKE

GRANT WALLACE

REGIONAL MEMBERS

W. W. HENDERSON, Logan, Utah

J. C. CHAMBERLIN, Riverside, California

E. P. VAN DUZEE, *Editor*

E. C. VAN DYKE, *Associate Editor*

F. E. BLAISDELL, SR., *Treasurer*

Published at the California Academy of Sciences, Golden Gate Park, San Francisco, California.

Entered as second-class matter, February 10, 1925, at the postoffice at San Francisco, California, under Act of August 24, 1912.

